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THE COAL AND IRON RECORD.

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THE ENGINEERING AND MINING JOURNAL

Is devoted to MINING, METALLURGY, GAS MAKING and ENGINEERING.

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Correspondence and general communications and books for review should be addressed to MR. ROTHWELL. Business communications should be addressed to the Secretary.

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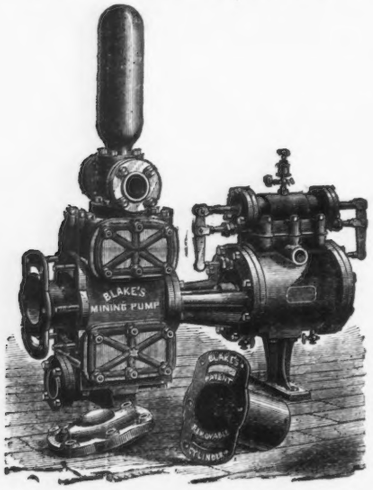

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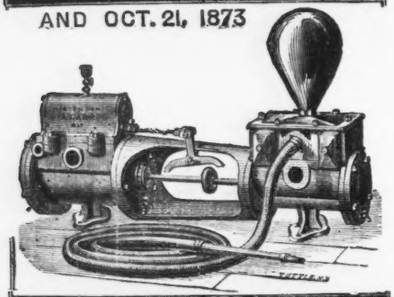

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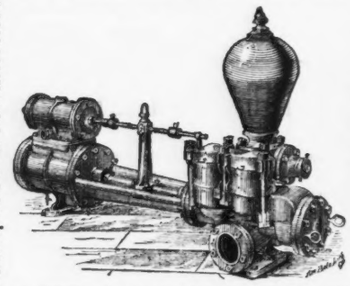

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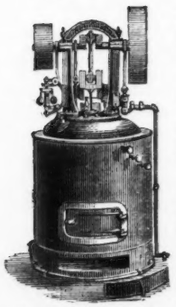

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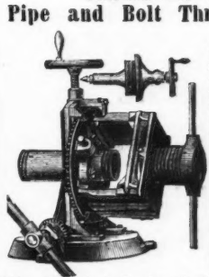

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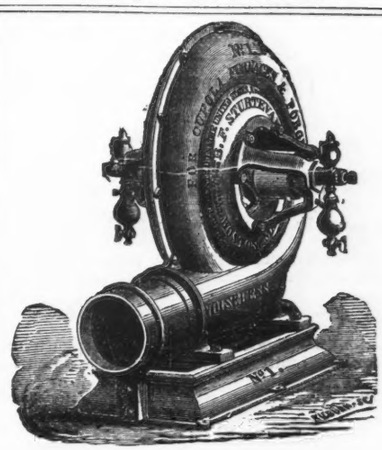

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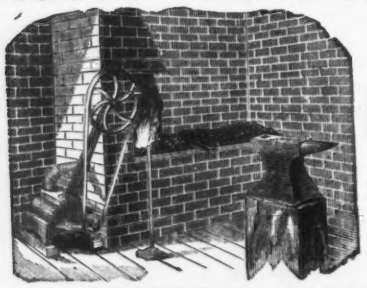

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THE ENGINEERING AND MINING JOURNAL.

RICHARD P. ROTHWELL, C. E., M. E.
ROSSITER W. RAYMOND, Ph. D. } Editors.

NOTE.—Communications relative to the editorial management should be addressed to Mr. ROTHWELL. The articles written by Mr. Raymond will be signed with a star.

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The Late J. G. Witherbee Esq.

THE death of this prominent iron master and member of the Institute of Mining Engineers, was recently announced.

Mr. WITHERBEE was a member of the firm of WITHERBEE, SHERMAN & Co., of Port Henry, and President of the Cedar Point Iron Company, and of the First National Bank of Port Henry. In 1871, Mr. WITHERBEE was elected a member of the Institute of Mining Engineers, and many of the members will recollect the pleasant visit of the Institute to the mines in Essex Co., where they were received with great hospitality by Messrs. WITHERBEE, SHERMAN & Co.

Mr. J. G. WITHERBEE was a brother of Mr. T. F. WITHERBEE, well-known as a contributor of technical papers of great value to the Institute.

Mr. Gowen's Last Move.

WE publish in another column the text of the agreement proposed by the Philadelphia and Reading Coal and Iron Company to the proprietors of blast furnaces along the Reading railroad and its branches. Having given our views at length, last week, with relation to this plan, we need add little at present. The agreement is certainly drawn with sufficient care as regards the protection of the interests of "the party of the second part." Mr. GOWEN'S inspectors grade the iron and determine the allowance for "sandage" without appeal; and the means are put into his hand for a summary enforcement of the contract at any time. The reports as to the reception of the proposition are contradictory, and we have received both favorable and unfavorable ones. While it still remains a question, we do not care to indulge in further speculations as to the probable effect of the foreshadowed revolution upon the iron industry of the Schuylkill region or the iron markets of the United States. *

The Himmelfahrt Mine.

THE annual report of this mine for the year 1874 shows it to maintain its position at the head of the Freiberg mines. The operations of the year were greatly hindered by the lack of water-power for the numerous pumping, hoisting and dressing machines which depend upon this agency. As is well known, the Freiberg district illustrates to a remarkable degree the system of utilizing the surface and mine waters, by driving underground machinery with the drainage from levels above the deep adits. The lack of water above led to the unpleasant abundance of it below. In 1873, the deepest workings were flooded; and in 1874, the water had only been lowered 75 feet when the surface waters again failed, and the water rose in the mines, in spite of the steam-engines, until the five deepest levels were inaccessible. It is estimated that the mine cannot be pumped out before the end of this year. Hence the ore extraction was confined to the reserves above the 8th level, which is over 1200 feet from the surface. The product was 779,371 centner of crude ore, or 270,659 of dressed ore, containing 15,794 lb. of silver, 29,839 centner of lead, besides copper, arsenic, sulphur and zinc, the total value of which, as paid by the smelting works, was 438,791 thaler, or about $316,000. The gross yield in 1873 was $365,000. The company has, besides, a share in the profits of the smelting works and various other sources of profit (interest on the reserve fund, etc.,) which swell its income for 1874 (including $74,000 cash on hand January 1st, 1874) to about $488,000. The total expenditures for the year, including $55,000 dividends, were about $434,000, leaving $54,000 cash on hand, besides the reserve fund of $379,000. The total assets of the mine amount to about $829,000; its debts to $129,000, leaving a net credit of $700,000. This sum includes the valuation of the machinery and of the land for agricultural purposes—not the value of the mineral deposit.

The Himmelfahrt has 14 shafts, of which the "Abraham" is the deepest (533.8 meters). Drainage is effected by 9 water-wheels, 6 steam-engines, one urbine and one hydraulic engine. Hoisting requires 6 reels driven by water-power and 6 driven by steam. The mine contains 4 machines (*Fahrkünste*) for raising and lowering workmen.

The total yield of this mine to the end of 1874 has been 527,103 kilos of silver, worth about $23,000,000, besides 5,244,800 kilos of lead, more than 1,000,000 kilos of sulphur (manufactured as sulphuric acid from the ores) and smaller quantities of copper, zinc, arsenic and nickel. The total receipts from 1852 to 1875 were, from ores, $10,048,000; from all sources, $10,770,000. The expenditures for the same period were in round numbers: (the *thaler* taken at 73 cents)

For construction account, including the sinking of main shafts	$ 728,800
Maintenance and pumping	828,100
Extraction	2,841,200
Ore-dressing	962,300
Taxes and contributions	1,246,390
General expense	483,900
Dividends	1,827,100

The largest dividend was in 1873, when half the reserve fund was divided among the stockholders, which, together with the profits of the year, gave them $616,700. The dividends have usually ranged from $432 to $547 (600 to 750 *thalers*) per share. There are 128 shares, which are subdivided into 2400 parts each, so that the miners themselves may become interested as owners by purchase. The par value of a full share is at present $2920, on which basis the investment pays about 15 per cent. But the market price of the shares is much greater, no doubt.

The area of the mining ground is 17,059,192 square meters or 4215 acres, in the vicinity of Freiberg. The country rock is the well known gray Freiberg gneiss, which is intersected from southeast to northwest by a dike of felsitic porphyry 15 to 30 feet wide, and by a network of numerous veins, a small proportion of which are sufficiently rich to pay for working. The ore-veins intersect also the porphyry dike, but in passing through it they are generally much split up, while just before entering and just after leaving it, they sometimes have a width of 1½ to 3 feet, and carry very rich ores. The cause of this splitting-up is, undoubtedly, the superior resistance offered by the porphyry, as compared with the gneiss, to the force which produced the vein-fissures. The product of ore from the veins worked last year in the Himmelfahrt was about 1590 kilos per square meter of vein-wall, or, say, 13,600 lb. per fathom.

The management of this mine reports unfavorably on machine-borers, alleging that when the motive power must be air compressed by steam, and must be conducted long distances underground, there is no economy as to total cost, whatever may be the saving in time, by the use of rock-drilling machines. All of which may be set down as a piece of German caution, not to say old-fogyism. Our friend, MEZGER, who has recently taken a contract to drive the everlasting Rothschönberger Stollen *through*, and who is putting machine drills into it, will show the venerable fathers a thing or two, under that head. Meanwhile, though they may be a little slow about new machines, the way of maintaining a regular and permanent industry and utilizing to the utmost every source of income, with prudently liberal expenditures, deserves study and imitation. *

Coking and Coke Ovens.

THERE are many varieties of coke ovens in use in Europe, each having its advocates and its opponents, the fact being, probably, that the peculiarities which adapt an oven to the coking of one kind of coal, unfit it for the treatment of certain other kinds. In fact, the characteristics of different coals do not appear to be taken sufficiently into account in selecting coking ovens. In this country, we avoid some of these difficulties by adopting in all cases, whether it be the best or not, the venerable bee-hive oven, which is now about as it was as long ago as 1826, at least. Previous to that time there appears to be some uncertainty as to the kind of oven used, though the fact that coking was sometimes done in ovens in England is mentioned as early as 1769, and the process of coking was known and practised for at least 100 years before that, as is evident from the fact that, in 1651, one JEREMY BUCK obtained a patent, in England, for making iron with stone-coal, pit-coal, or sea-coal *without charking*.

In this country, coking has been practised in piles or "pits" and in the round or bee-hive oven, and only in exceptional cases in the wide cylindrical or rectangular Belgian oven. In the Pittsburgh region, ovens of this kind, about 3 feet in width, were tried some years ago, but, it is said, did not give as good results as the bee-hive oven, which is now all but universal there, its usual dimensions being 11 feet diameter, and 6 feet high.

The operation of coking in these ovens is exceedingly simple. The coal is dropped into the oven through a hole in the crown, and is spread over the floor; air is admitted through openings left in the brickwork for that purpose, till a sufficient heat has been developed, when they are closed, and after a certain time even the openings in the roof are closed; the operation lasts altogether 48 hours, and each oven cokes about 5 tons of coal. When the coking is completed the door of the oven is opened and water is thrown on the incandescent coke, which is drawn out of the oven with rakes. As compared with the Belgian and Coppée ovens, which are simply rectangular prisms from which the coke is drawn or pushed by machinery, in one mass, and extinguished outside the oven, the expenditure of labor is much greater in the bee-hive oven; and from the very nature of the case the coking is done in part, at least, at a lower temperature and with greater irregularity. For in the one case the oven is cooled down by the water used to extinguish the coke, while in the

others, as soon as the charge is drawn, the oven, at a red heat, is refilled and the operation repeated. Experience has demonstrated the fact that, within certain limits, the higher the temperature at which coking is done the greater will be the yield of coke, and it may also be assumed that, as a rule, the higher the temperature and the longer the exposure to that temperature, the harder, more dense, and less combustible will be the coke; there does not, however, appear to be any advantage in prolonging the process of coking beyond 48 hours. The ovens which best accomplish these objects are, undoubtedly, the Appolt and the Coppée. The Appolt oven is practically a large brick chamber, about 17 feet by 12 feet and 13 feet high, divided by thin partition walls into 12 independent compartments or retorts, about 4 feet long and 1 foot 6 in. wide, having a free open space round each, in which the gases expelled in the process of coking are burnt, the resulting heat being transmitted through the walls of the chambers to the coal contained in them. The coking operation lasts about 24 hours; at the expiration of that time the bottom plate of the compartment or retort is removed, the charge falls out by its own weight and is cooled by throwing water on it.

The advantages of the Appolt oven are that it makes a harder coke, and makes a larger percentage than can be procured by any other. Many coals that will not cake in the ordinary bee-hive oven, will make a good and consistent coke in the Appolt, owing to the high temperature at which the operation is performed. It would be well adapted to coking semi-bituminous slack and the lignite caking coals of the West. The chief objections, and they are serious, are the high cost and the probability of the coke retaining a larger proportion of water than it contains when extinguished in the bee-hive oven.

The Coppée oven has obtained great favor in Europe where, even in 1873, there were 600 or 700 in Belgium, and 1400 or 1500 in Germany. It consists essentially of a series of rectangular prisms, 30 feet long, 15 inches wide and about 3 to 4 feet high. The heat for coking is communicated, as in the Appolt system, through the thin walls which separate the oven from the gas flues.

This oven is less costly than Appolt's, and to a great extent attains the same objects. The manipulation of the charges is done by machinery, a ram pushing the entire charge out of the oven when sufficiently carbonized. The process of emptying and refilling the oven need not occupy more than eight minutes, and at the Ebbw Vale Works, in Wales, the total cost of coking is one shilling a ton, the contractor. taking the crushed and washed coal from the bins, finds all the labor for filling and discharging the ovens (including the working of the coke ram) and filling the coke into trams. The oven is not adapted to coking any but fine coal, so for this reason and, also, to be able to get rid of the impurities, the coal is crushed and washed.

It is stated that the coke quenched outside of the oven, as in the Coppée system, contains more water than that from the bee-hive oven; in the former case, at the Ebbw Vale Works, six per cent. of water was found in the coke, while but 0.8 per cent. remained in that quenched inside the bee-hive ovens. This is a rather serious matter, but with care, the amount of water in the coke could be, doubtless, greatly reduced. The great saving of labor and the superior quality of the coke made from dry coals, and perhaps even from any coals, seems to overbalance the disadvantages mentioned, and their use in England, France, Belgium and Germany appears to be making progress. For a given make of coke per day, the Coppée ovens require much less space and are said to cost less in first establishment and in running expenses, than the old bee-hive oven, which we use almost exclusively. The Coppée Coke Co., of London, publishes very favorable certificates, but it should be remembered that the company, naturally, only dwells on one side of the question.

In any case, a careful investigation of the coal to be coked is an essential preliminary to the selection of the kind of oven best adapted to the work, and the money invested in such an investigation by a well-qualified expert is always well spent.

There is no more expensive management than that which, through a false economy, neglects to avail itself of the experience and knowledge acquired by others, and goes to work to "find out," by the costly process of experiments on a large scale, what has been already found out and recorded by others.

The Centennial Committee of the Institute.

WE presume every member or associate of the Institute of Mining Engineers, now resident in this country or Canada, has received a copy of the following circular:

CENTENNIAL COMMITTEE OF THE
AMERICAN INSTITUTE OF MINING ENGINEERS,
206 South Fourth Street.

PHILADELPHIA, July 5, 1875.

"DEAR SIR: The undersigned, appointed by vote of the Institute a Committee to make arrangements for the convenience of members and associates, and of foreign visitors, who may attend the Centennial Exposition, have decided provisionally upon the following plan, additions or amendments to which you are respectfully invited to suggest. The object of the Committee has been to devise a simple, practicable, and useful programme, neither ostentatious nor likely to intrude upon ground occupied by other societies, and at the same time capable of such expansion as circumstances may indicate and means permit.

"1. The Committee will ask of the Institute, at the next (October) meeting, a vote authorizing the adjournment of the annual meeting of May, 1876, to the third Tuesday of June, the adjourned session to be held in Philadelphia.

"2. The Committee will endeavor, by special invitations, to secure the attendance at the Philadelphia meeting of English and Continental mining engineers and metallurgists, and, if practicable, to give to the meeting an international character.

"3. The Committee proposes to engage suitable rooms in Philadelphia for the period of the Exposition, to furnish them with technical periodicals, and books of reference concerning the resources and industries of the United States, to secure the attendance of a competent secretary, and to keep these rooms open, day and evening, as the Centennial Headquarters of the American Institute of Mining Engineers. The practical object of this measure will be to afford to members and associates a place for social reunion, for writing and receiving letters, and for obtaining desired information or introductions. Foreign visitors interested in mining or metallurgy would, on making themselves known to the Committee, receive cards entitling them to the privileges of the rooms, and particularly to the services of the secretary in charge, who would be able to assist them in any line of inquiry which they might wish to pursue, giving them statistics, general information, directions, advice, and letters of introduction to all parts of the country. The same cards would enable them to take part in the proceedings or excursions of the Institute. The addresses and prospective movements of members or visitors could be posted in books kept for the purpose; and letters could be forwarded to them regularly, or friends advised of their whereabouts.

"The Committee has received assurances of co-operation in various respects, tending to add still more to the pleasures and facilities which may be gathered around this idea. But the object of the present circular is to sketch briefly the outline of what is proposed as a minimum. You will perceive that the only necessary part of the plan involving extra expense is the maintenance of the Centennial Headquarters.

"The Committee estimates that the sum of $5,000 will be ample for the purposes of rent, furnishing, lighting, stationery, care of rooms, and salary of attendant secretary. This sum it is proposed to raise by a voluntary subscription; and you are respectfully requested, if the plan meets your approval, to notify Mr. J. S. ALEXANDER, at the above address (which is the temporary office of the Committee), of the amount which you are willing to subscribe. The names and amounts will not be made public; there is no obligation on your part to subscribe, other than such as your free wish to co-operate for this object may impose upon you, within the limit of your convenience. It may be added, to show the range of subscriptions thus far, that there have been received already from members and associates a number of subscriptions of $100 each, and others of smaller sums, down to $10. The subscriptions will be payable on or before January 1, 1876, provided a sufficient amount shall have been pledged to warrant the Committee in going forward. But you are earnestly requested to inform the Committee at once of your purpose in the matter, since there is a very large foreign correspondence to be carried on, if this plan is to be made practically profitable to the profession.

Awaiting your early reply, we are

Yours very truly,

ECKLEY B. COXE,
THOS. EGLESTON,
J. S. ALEXANDER,
R. W. RAYMOND,
} *Committee.*

We need add nothing to the clear statement of the Committee, to demonstrate that the plan thus set forth possesses the combined merits of practicability and usefulness. Whether many foreign engineers avail themselves of it or not, it will furnish to members of the Institute and their colleagues a most agreeable place of social reunion; and experience has shown that the simple opportunity of meeting is sufficient to breed all kinds of pleasant and profitable entertainment. We know that the Committee is cautiously promising far less than it will perform. It remains only that the members and associates shall do their part, and make known promptly to Mr. ALEXANDER the amounts of their subscriptions. Decide promptly what you think best to do, and notify the Committee, in order that it may report decisively at the October meeting of the Institute.

*

The Emma Mine.

A CIRCULAR from the Board of Directors of the Emma Silver Mining Company (Limited), dated April 29, 1875, explains the policy of the Board in proceeding against Messrs. PARK, BAXTER and STEWART, the vendors, and contains the following passages:

"More recently we have had an opinion given by Professor BLAKE, and it is but proper to state here that Professor BLAKE has unhesitatingly condemned in the strongest language the deception practised upon him and the British public by the use made of letters dated the 26th and 27th July, 1871, addressed by him to Mr. PARK and General BAXTER, after an inspection of the mine on their behalf. A misleading paragraph, which applied to the past and not to the future of the Mine, was extracted from his letter of 26th July and inserted in the Prospectus, while the opinion given as to the proximate exhaustion of the mine was carefully suppressed.

"The Chairman employed Professor BLAKE in November last, to make an inspection of the mine, and in his report dated 14th December, 1874, he takes a most unfavorable view of the future prospects of the mine. As a matter of much interest to the shareholders, the following extract from his letter to PARK and BAXTER of the 27th July, 1871, is now given in juxtaposition with his more recent report of December, 1874.

"He says, under date the 27th July, 1871: 'We cannot expect the ore mass to retain its extraordinary dimensions; *according to my judgment it will soon be found to thin down in every direction, in length and breadth.* There is yet an uncertainty on my mind with regard to the immediate thining out of the ore mass followed down in the lowest shaft, whether it is the main body of the ore that thins out or a side mass; but the appearance is such as to throw a strong doubt upon the persistence in depth of the main body. As to the occurrence of other ore masses or chambers beyond, either horizontally or below, I can only say that there is a probability of finding others, but it is by no means certain that they will be found, and I would not count much upon them. *At the present rate of extraction the mine will soon be stripped, and for the present practically exhausted,* at least for some time, or till another body of ore can be found. * * * * Deposits in limestone are always regarded by miners as treacherous; we cannot depend upon them. They are apt to be in bunches or pockets, and it will not do to regard them with as much confidence and expectation as we do regular veins with well marked walls and hard veinstones. There is a chance that any one of the

seams and masses now standing at the ends of the chamber, or in the bottom, may soon open into large chambers. I cannot say they will not, but having a strong conviction that the present ore mass is the largest and principal one, and that it will be tedious and difficult to mine for others, it is my duty to state my opinion for your consideration and guidance.'

"In December, 1874, Professor BLAKE reports as follows: 'A thorough inspection was made, commencing Nov. 23d, and continuing until the 30th, and the water having been pumped out for the purpose, I reached the lower workings. It is well to premise that I made a thorough survey of the mine in the month of July, 1871, when the production was at its greatest height and the walls of the great chamber were fully accessible. I thus became familiarized with the mine, with the character of the enclosing limestone and its position relatively to the ore, with the direction of the mass of ore, and such other characters as enabled me to judge of the nature of the deposit. This is more important as respects the last examination, inasmuch as that older part of the mine has been rendered inaccessible by caving in. Before proceeding to describe the mine in detail, recounting what I have observed in its various parts, I deem it advisable to state in brief the conclusions to which I have been led by my examination. I regret extremely that I am unable to report encouragingly of either the present or prospective condition of the mine. It is practically worked out. The ore has been taken out, leaving nothing in the cavity or chamber from which it was extracted but falling rocks and crushed timbers, a wreck dangerous to approach. This is the condition of the great chamber from which so much ore has been taken. The boundaries of limestone have been reached on all sides. *Explorations in length and depth have developed nothing but limestone; no new bodies of ore are in sight. There are no indications of any, and there is no special reason to expect to find any more. There are no well-defined vein-walls, with selvages or 'gouge' to follow in search of ore. There is no regular veinstone or gouge. The transition from ore to limestone is sudden. Nor is there any recognizable peculiarity of the limestone country-rock leading to ore.* Certain strata of limestone extending diagonally up the mountains in a north-westerly direction, are more or less mineralized with argentiferous galena accumulated irregularly in deposits, masses or bunches of ore, not necessarily connected or exposed by croppings at the surface. No special ore-bearing stratum has been recognized, nor does there appear to be any defined ore channel within which masses of ore are deposited. and which may be followed in expectation of realizing ore sooner than in other parts of the strata. These conditions render exploratory work not only uncertain, but tedious and expensive. Exploration of this nature is the only chance for the mine. All hope from possible exploration in depth is cut off by a great slide or movement of the rocks reached by the deep workings. This is the unfortunate condition in which I find your mine with regard to prospective production. *It is reduced to a chance of finding ore by drifting and cross-cutting in the country-rock to the north-west underground which has already been unsuccessfully prospected by several companies.*'"

"What is Steel?"

Written for the ENGINEERING AND MINING JOURNAL, by H. M. HOWE, M. E.

CONTINUED FROM PAGE 213.

FORMERLY all iron which could be greatly hardened, and which could yet be made malleable, both when hot and when cold, by annealing, was called steel. There can be no question that, at least until twenty years ago, this remarkable capacity for being made at will either very malleable, so as to be easily forged into any desired shape, or very resilient, hard, and strong, so as to retain that shape with great persistency, was considered the most prominent characteristic of steel. The qualities of greater hardness and tensile strength, and less malleableness, even in the annealed state, than wrought iron has, were also closely connected with it. These are all given in different degrees by carbon and the other elements already named. They form a distinct group of properties which may exist alike in rough and polished, homogeneous and heterogeneous, pure and impure iron.

Steel was also incidentally associated with smoothness, purity, and homogeneousness, to a certain extent. With the two latter qualities, because the processes which gave it its carbon incidentally made it purer and more homogeneous than ordinary iron; with smoothness and polish, not because it was necessarily smooth and polished, but because the ordinary forms of steel with which people were familiar happened to be so. In the same way we say "as sharp as a Damascus blade," "as clear as glass," not that a Damascus blade unsharpened would be any the less a Damascus blade, nor that cloudy or opaque glass would be any the less glass.

If, before MR. BESSEMER made his first steel, a bar of heterogeneous, rough, laminated iron, produced by some unknown process, containing 1.00 per cent. carbon, had been presented to, say, Prof. FARADAY for physical examination, he would have pronounced it steel; rough, unpolished, lustreless, and impure, but still steel, because of its resilience and its power of hardening and annealing. If, on the other hand, a bar of iron produced by fusion in the crucible, homogeneous, crystalline, and polished, but still so free from carbon, etc., that he could not increase its hardness by sudden cooling, had been presented to him, he would have said, "This is malleable iron. It has many qualities we do not ordinarily find in wrought iron, and which we look for in steel; but the essential characteristics of steel are wanting, in that it cannot be hardened, and that its resilience, hardness, and tensile strength are low."

I give here some facts and quotations which go to prove that the term "steel" referred to these prominent characteristics, on which its efficiency depended, and not to such properties as purity and homogeneousness, which ordinarily happened to be present in steel.

"Steel" is given in CLARK'S *Concordance of Shakespeare* 64 times. From a careful and, I think, impartial examination of the text I find that it is used 29 times in the sense of *arms, armor,* or *cutting tools*, 17 times to denote a very *hard* material, 11 times as emblematic of *strength*, 3 times in the phrase "As true as steel." [The *truth* of steel I suppose is the property of holding a true i. e. unalterable and persistent edge and shape. A sword of the thoughest, softest, and homogeneous iron, if containing only, say, 0.10 per cent. carbon, easily bent, and hardly capable of cutting wood, would not be considered so emblematic of truth as a Damascus blade.] It is used once as emblematic of *sharpness*, once of *polish*, once of *heat* (red hot *steel*,) and once as a material of a curling iron.

In short, in 60 out of 64 passages, SHAKESPEAR unquestionably uses steel in the sense of iron of the second of the three classes already enumerated, in which sense it is fair to infer that he does in the remaining four.

In CRUDEN'S *Concordance* it is given as occuring three times in the Bible. In Samuel II. 22, and in Job 15-12 the "Bow of steel" is regarded as a most resilient weapon. In Jeremiah, 15-12, "Shall iron break the northern iron and the steel" it is contrasted with other less strong varieties of ron

JOHNSON defines steel as "A kind of iron, refined and purified by the fire with other ingredients, which renders it white, and its grain closer and finer than common iron. Steel, of all other metals, is that susceptible of the greatest degree of hardness—when well tempered; whence its great use in the making of tools and instruments of all kinds. *Chambers.* 2. It is often used metonymically for armor. 3. Chalybeate medicines. 4. It is used proverbially for hardness."

He unquestionably refers to iron of the second class, considering the power of hardening, and its constant companion hardness, as its most salient properties, the latter being proverbial.

WORCESTER, 1860, defines it as "1. Iron combined with a portion of carbon, and sometimes of silicon, etc.; a carburet of iron. * * *. ☞ Iron is employed in the arts in three different states: as crude or cast iron, as steel, and as wrought iron, the differences depending upon the relative amounts of carbon with which the metal is combined. Cast iron contains a larger proportion of carbon than steel, and steel more than wrought or malleable iron. * * * * *Tomlinson.* 2. Armor; a weapon or weapons. 3. A proverbial term for hardness. * * *." He does not even refer to any other qualities (such as purity, smoothness, and homogeneousness) than those directly caused by the degree of carburization of the second class of iron.

WEBSTER, 1864, defines steel as "1. Iron combined with a small portion of carbon. It is used in making instruments, and is especially useful as the material of edged tools. 2. Hence, an instrument made of steel, as a sword, knife, or the like. 3. Specifically an instrument for sharpening table knives upon. 4. Anything of extreme hardness; hardness; sternness; rigor. 5. A chalybeate medicine." He evidently regards slight carburization as the essential quality of steel, hardness and its other consequences being its most salient features.

PERCY says,* "When carbon is absent, or only present in very small quantities, we have *wrought-iron*, which is comparatively soft, malleable, ductile, weldable, easily forgeable, and very tenacious, but not fusible except at temperatures rarely attainable in furnaces, and not susceptible of tempering like steel; when present in certain proportions, the limit of which cannot be exactly prescribed, we have the various kinds of *steel*, which are highly elastic, malleable, ductile, forgeable, weldable, and capable of receiving very different degrees of hardness by tempering, even so as to cut wrought iron with facility, and fusible in furnaces; and, lastly, when present in greater proportion than in steel we have *cast-iron*, which is hard, comparatively brittle and readily fusible, but not forgeable or weldable. The differences between these three well known sorts of iron essentially depend upon differences in the proportion of carbon, though, as we shall learn hereafter, other elements may, and often do, concur in modifying, in a striking manner, the qualities of this wonderful metal."

BAUERMANN says,** "Those varities of iron in which the amount of carbon is above the maximum of malleable, and below the maximum of cast metal are known as steel. The distinguishing property of this class of products is the power of being hardened or softened at pleasure, by sudden or rapid (*sic*) cooling, by the process known as tempering."

GRUNER,*** speaking of Bessemer wrought iron containing 0.15 per cent. carbon, says "We see that this is homogeneous iron and not steel." †"The practical man will call every intermediate product steel, which may be tempered, but which remains malleable hot and cold when not tempered, and this metal will be steel, whatever be the method followed to obtain it." Speaking of the Bessemer process he says "According to the degree of decarburization, ordinary cast steel or cast wrought iron will be produced. The latter is called of late wrought iron or homogeneous metal."

WM. FAIRBAIRN says, ‡ "Steel is a carburet of iron, containing a less proportion of carbon than cast-iron by smelting. The latter, it has been seen, contains 4 or 5 per cent. carbon, whilst in steel the proportion is only 0.5 to 1.5 per cent."

Prof. RANKINE§ says: "Steel, the hardest of metals and strongest of known substances, is composed of iron with from 0.5 to 1.5 per cent. of its weight of carbon. These, according to most authorities, are the only essential constituents of steel."

KARSTEN‖ says that "When combined with carbon, not exceeding certain limits, iron increases in tenacity, and, consequently, in elasticity; as also in malleability, ductility and hardness. The last property is increased by sudden cooling after heating; and when it is considerable, as is the case in all iron containing more than from 0.2 per cent. to 0.25 per cent. of carbon, the metal is designated steel." "And 2 per cent. of carbon appears to be the limit between steel and cast iron."

The last six writers also go on to speak of blistered, puddled, shear and other varieties of steel *as steel*, although they are necessarily heterogeneous to a certain extent, and never absolutely free from cinder.

But it is unnecessary to multiply examples. Enough has been quoted to establish that, at any rate until within a very few years, the essential distinction between steel and the other kinds of iron has been based upon the possession of the properties given by carbon, and not upon homogeneousness, purity, or other comparatively unimportant qualities.

Granting this, how shall we frame a definition that shall include all classes of steel that are now known and that may be discovered hereafter, and yet exclude all classes of cast iron and wrought iron?

What property or combination of properties is most essential to steel, the possession of which of itself constitutes it, the absence of which is impossible in it?

It seems to me that resilience and the combination of comparative malleableness in the annealed state with great hardness, tensile strength, and resilience in the tempered state, are its most important qualities; and that, above all, its resilience is its most essential feature.

Why is it that steel alone can be used for cutting tools? Is it on account of its hardness alone? Not at all. If it were, chilled cast iron could replace it, which is indeed sometimes so hard as to resist the action of the hardest steel. Is it on account of hardness combined with density and closeness of structure? No; if it were, cast iron, rendered compact by great pressure when fluid, and hardened by chilling, or at any rate the diamond, might replace it. It is on account of its great resilience. A cutting tool of wrought iron, on striking an obstacle would be bent back, but could not recover its shape; a tool of chilled cast-iron could not be bent back, but would break off. A steel tool would be perhaps bent back, but would immediately recover its original shape. From this, and from the hardness implied by its resilience, comes the power of

* "*Metallurgy. Iron and Steel.*" 1864. p. 102.
** "*Metallurgy of Iron.*" p 4.
*** "*Manufacture of Steel.*" LENOX SMITH'S translation, p. 51.
† *Ibid*, p. 8.
‡ "*Iron Manufacture.*" p. 102.
§ "*Civil Engineering.*" 1870. p. 506.
‖ "*Ueber die Carburete des Eisens.*" 1848.

"holding an edge." Steel is not only extremely hard, offering great resistance to change of form, but it is capable of suffering great change of form without fracture or permanent set. Should an immense diamond be cut into the shape of a cold chisel, its edge would be broken by a blow which would not injure one of steel, simply because steel is highly resilient, while the diamond is not, though exceedingly hard and compact. So with springs. A wrought-iron spring is comparatively easily bent, but it is not bent far before it is "set." A cast-iron spring might offer great resistance to bending, but a slight bending would break it. But a steel spring not only stoutly resists bending, but can be bent a great way without breaking.

At the instant of explosion the chamber of a gun is distended. Before this distension has been carried far, the wrought-iron gun is distorted beyond the point from which it can recover its original shape, and it is bulged ; the cast-iron gun, beyond the point at which cohesion between its particles ceases, and it is burst. With a steel gun, whose cross-sections present the same elastic tensile strength as that of the cast or wrought-iron gun, the force of the explosion expends itself in distending the chamber. But it must carry this distension a long way, and therefore keep up the bursting pressure a long time, before it can burst or bulge the gun.

A sudden strain is thrown on an engine, sufficient to "stall" it, and to bend its crank. How would a wrought-iron, a cast-iron, and steel crank, all of the same transverse strength, act in resisting the shock ? When the first is bent it cannot recover its shape. The second is rigid ; it cannot yield ; before the schock has bent it far it is broken. The steel crank yields ; the momentum of the moving parts of the engine is spent in the work of bending it ; time is given it to stop them ; then, quicker than thought, it forces them back. This is due to its resilience, to the great amount of actual work it requires to stretch it or bend it to the limit of its elasticity.

I need not multiply examples. It is easy to see that in very many cases (at least where dynamical strains are to be resisted) where steel is superior to wrought and cast-iron, it is mainly on account of the great resilience of the one and the low resilience of the others.

This fact is often lost sight of, and steel is often spoken of as if employed solely on account of its hardness or tensile strength. That it is in no case superior on account of its hardness alone, is evident when we consider that in cases where this quality is the sole requirement chilled cast-iron can replace it. We have a familiar example of this in the case of the outside of car wheels, where resilience and tensile strength are unimportant compared with hardness —the power to resist abrasion—and where chilled cast-iron is probably superior to steel.

In some cases, no doubt, where purely statical strains are to be resisted, as in the tension members of girders, the great tensile strength of steel seems to be much its most valuable property. But whenever these structures are subjected to sudden or vibratory strains, as in the case of bridge girders, I believe that careful study will show the resilience of steel to be a very important element, either of superiority or inferiority. Moreover, in many such structures where, from bad fitting, from contraction or expansion from variation of temperature, or from other causes, wrought iron would be stretched to a point from which it could not recover its original shape, a steel piece, of the same elastic tenacity, would be much more valuable on account of the much-greater *distance* it could be stretched within the limits of elasticity. Further, high tensile strength is essential to high resilience. For a highly resilient material is not only perfectly elastic under great distortion, but offers great resistance to distortion, and, *a fortiori*, to rupture. Thus, while india-rubber can be distorted much more without set or rupture than glass, ivory, or steel, its resilience is much lower.

For some important purposes, as for engraving, for taps, dies, and some other cutting tools, and for many articles to be finished cold in the machine-shop, the combination of comparative malleableness and softness in the annealed state with great hardness in the tempered state seems the most important property of steel. But I doubt if there are many even of these cases, in which the great resilience of the tempered metal is not a very noticeable property.

In short, I believe that those cases in which the resilience of steel, especially of tempered steel, is the essential condition of its fitness, and in which the low resilience of cast and wrought iron is the cause of their unfitness, are much more common and important than in which its resilience is of but secondary importance, and in which its superiority arises from its tensile or compressive strength alone, or from its great malleableness, when annealed, combined with its hardness and strength when tempered. Hence, that if any one property is to be selected as the sole basis of distinction between steel on the one hand, and wrought and cast iron on the other, it is its high resilience (if resilience can be termed one property).

That is to say, if some new compound or alloy of iron should be discovered, whose resilience should be as great as that of tempered steel of, say, 1.25 per cent. carbon, and which had the tensile and compressive strength thus implied, these qualities fitting it for springs, cutting tools, instruments, etc., it would be steel, even if its malleableness, hardness, and tensile strength were not in the least affected by tempering and annealing. Conversely, if such a new compound had high tensile strength and hardness, which, with its malleableness, were very greatly affected by tempering and annealing, but had no more resilience, even when tempered, than lead, or even than wrought iron, it would not be steel. (It must be remembered that to bring the resilience of such a material down to that of wrought iron, we must suppose that it would be broken or set by a much smaller distortion of size or shape than would suffice to give wrought iron a set. For the measure of its resilience is the product of the greatest distance a unit of it can be stretched (etc.) within the limits of elasticity, into the force required to stretch (etc.) it that distance. Therefore, if one of two metals of equal resilience has a much higher elastic tensile (etc.) strength than the other has, the greatest distance a unit of it can be stretched (etc.) within the limits of elasticity, will be proportionally less than is the case with the other.)

What we know on this head renders it very unlikely that any compound of iron will ever be found which will have great resilience and yet be only slightly affected by tempering. The kinds which are most affected by tempering are the very ones which have the greatest resilience. Still, such a compound is altogether possible, and a perfect definition should include all possible kinds of steel, and exclude everything else.

TO BE CONTINUED.

Steam Engines or engines for the more efficient use of Steam for driving Machinery.—This invention consists of a fly-wheel cogged on its outer rim or formed with cavities in its periphery to receive steam from a chest held in contact with it, and constructed to deliver the steam supply into the cavities in such a manner as to cause the cogged wheel to revolve on its bearings in such a way as to give motive power.—*F. Turnock, Purland Chase, Ross, Herefordshire.*

Statement of Ore, Bullion, and Base Metal Yield for July, 1875.

UTAH.

Gold dust, estimated	$ 4,000
Silver bars	84,000
Lead, rich in silver	292,000
Copper and lead	10,000
Ore shipped out of the Territory, silver, lead and copper	280,000
Iron ore	10,000
Coal	100,000
Total for the month	$780 000

NEW MEXICO.

Gold dust and retort	$ 21,000
Silver bars	55,000
Ore shipped	104,000
Total for the month	$130 000

COLORADO.

Gold and silver bullion, bars	$217,000
Gold dust and retorts	200,000
Lead and copper, free from gold and silver	31,000
Ore shipped out of the Territory	172,000
Coal	140,000
Total for the month	$760,000

SUMMARY.

Colorado	$760,000
Utah	780,000
New Mexico	180 000
Grand total	$1,720,000

—Georgetown *Mining Review.*

The Ore Market.

Prices for ore are low all over the West, consequent upon the fall in silver. The supply at the same time is good and increasing. Large lots of gold dust are coming in from placer mines, as clean-ups are being made constantly. The supply of metal from this source shows a large increase over figures of last year. The most noticeable gain is in Utah and New Mexico. The indications of a larger amount of ground under work are many. Active shipments to the East are being made, and the competition of the works at St. Louis Chicago, Pittsburgh and Omaha, will probably cause a rise in the value of argentiferous galena before long.

GEORGETOWN, COL.

No. of oz.	Price per oz.	Price per ton.	No. of oz.	Price per oz.	Price per ton.
100	$ .65	$ 65	300	$ .95	285
150	.82	123	400	1.00	400
200	.83	176	500	1.02	510
250	.92	230	1000	1.07	1107

SALT LAKE, UTAH.

Salt Lake prices are regulated as much by the percentage of lead as of silver, and may be stated about as follows: Ore containing 45 per cent. in lead, and 60 oz. in silver, will sell for $60 per ton. If the ore goes above 45 per cent. in lead, add 75 cents for each one per cent. If it goes below 45 per cent. in lead, deduct 75 cents for each unit, down to 30 per cent. If the ore assays above 60 oz. in silver, the price increases per oz. Ore containing 44 per cent. of lead and 30 oz. in silver, sells for $1 12 per ounce.

AUSTIN, NEV.

Reduction charges, $35 per ton, after deducting 20 per cent. of the assay value of ores carrying 400 oz of silver, or less, per ton; and 18 per cent. of assay value of ores of a higher grade.

WHITE PINE, NEV.

The Hamilton Mining and Smelting Company are offering the following prices for ores:

Lead Ores, assaying $20 and under $100, 70 per cent. of silver assay value.
Lead Ores, assaying over $100 and under $150, 72 per cent. of silver assay value.
Lead Ores, assaying over $150 and under $200, 75 per cent. of silver assay value.
Lead—25 cents will be paid for each per cent. over 30.
Smelting charges $20 per ton.
Copper Ores—same rate as lead ores, with an additional charge of $5 per ton for smelting.
Nothing allowed for lead contained in copper ores.
Ores of higher grade—rates by special agreement.

The above schedule of prices is based upon the standard value of silver.—Georgetown *Mining Review.*

Cape Breton Coal Trade.—The Boston "Shipping List" gives a statement of coals delivered at that port up to the 30th ult. The quantity received from Nova Scotia up to that date was only 23,425 tons, while in 1874 the receipts from the Province to this date were 60,608 tons. We imagine our mining companies and all interested in the coal trade might as well, first as last, make up their minds not to depend any longer on the American market, as even if the duty is taken off, it is not likely that Nova Scotia coals can compete with the Pennsylvania and Virginia bituminous coals. They are mined cheaper than our coals, and are placed in Eastern ports at exceedingly low rates of freight—only $1 per ton from Baltimore to Boston, Salem, &c. The Old Sydney Mines are not dependent on foreign markets, having established a trade in New Brunswick, Newfoundland and this Province, which is not fluctuating, and, being principally for home use, will naturally increase from year to year. The Victoria Mines, whose coal being very similar to, if not indeed exactly the same as, that of the Sydney Mines, is very much liked for domestic use, are doing fully as much as in other years, and we trust under the good management of JOSEPH SALTER, Esq., the proprietors will at no distant day surmount their financial difficulties and receive a dividend on their outlay. The International Railway and Pier are fully occupied with shipments from the International and Gardiner Mines, which seem to be the only collieries here which are sending any large quantities of coal to Canada, although the Pictou Collieries are weekly sending from eight thousand to ten thousand tons up the St Lawrence River. The reason probably will be found in the fact that the lessees of the International and the principal shareholders of the Gardiner are (as are a majority of the shareholders of the Pictou mines) residents in Canada, and exert themselves to supply that market, to the exclusion of other companies, whether English or Provincial. The Cape Breton Company have not shipped much coal this season, and probably will not effect sales of any large quantities, until negotiations now in progress in London are brought to a definite conclusion. It seems clear that until new markets can be opened in the West Indies, South America and other countries, where coal depots are established for the immense fleets of steamships now navigating every sea, our coal proprietors must depend on the markets of the Dominion. Fortunately, in Quebec and Ontario, where wood has been mostly used for fuel, it is becoming scarce and dear, and coal is fast coming into general use, and large quantities are imported from the United States mines The amount shipped from Nova Scotia to Quebec and Montreal has doubled and quadrupled within a few years, and if we have any chance of competing in the United States markets with their own coal, we most certainly ought to be able to compete with them in the Canadian markets. We think, then, the wisest course for proprietors of collieries in Cape Breton to pursue is, while selling all they can, at ever so small a profit, in the United States, to look after the trade in the more Southern waters, but to make special efforts to enlarge their shipments to all places in the Dominion, and to take such steps as may tend to increase the consumption of coal in the future in the Upper Provinces. The Americans are working hard to get the Canadian coal market in their own hands and are building through lines of railway for that purpose, and we must energetically endeavor to secure a fair share of the trade and not let our American cousins monopolize the coal trade as well as the manufactures of the Dominion.—*Cape Breton Times.*

Improvements in Blast Furnace Construction of the North Jersey Iron Company.

THE North Jersey Iron Company has been energetically develeping its valuable ore deposits at Ch ster, and with a view of thoroughly testing the product of the mines, has lately introduced a number of improvements. The President, WM. J. TAYLOR, ESQ., has patented an improvement in calcining kilns and the company is now erecting several of them. A portion of the ore is to be converted by the Company into iron, and for that purpose MESSRS. WEIMER and BIRKINBINE, Engineers, were employed to prepare plans for a Blast Furnace plant. The design, of the furnaces embraces so much that is novel that we reproduce the cut here.

The main object of the designers is, as they explain it, "to reduce the amount of material employed and labor required in the construction of a stack to the minimum, having due regard to the permanency of the structure and its economic operation."

As the interest upon the construction account influences the cost of each ton of pig iron made in a blast furnace, any saving in this item is a subject of importance to iron manufacturers.

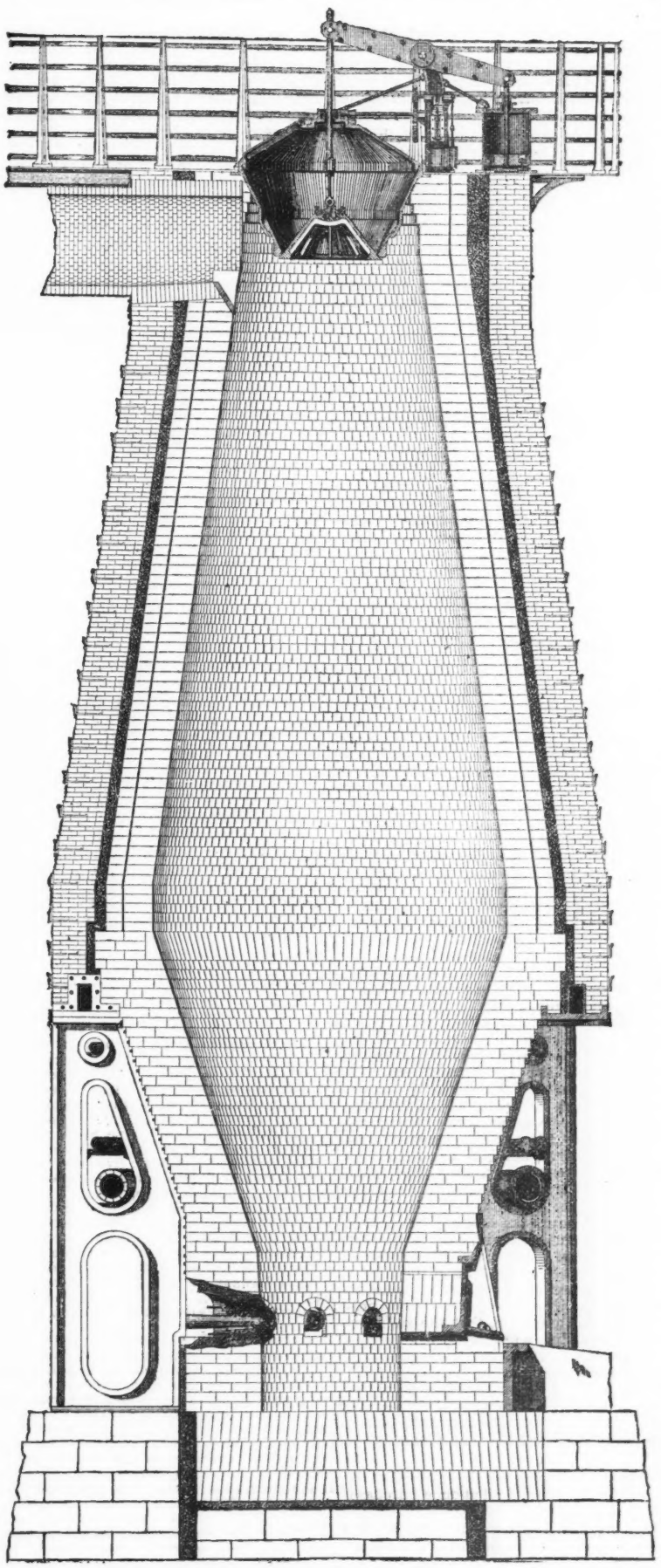
The old type of blast furnaces is a massive square stack, with Gothic arches leading to the tuyere openings. These have in later years given place to more symmetrical masonry piers, with iron mantles over the tuyere openings or to heavy iron columns and mantles.

The design of the furnaces illustrated is claimed as a still further improvement in the substitution of heavy iron housings, which, rising to nearly double the hight of the ordinary columns, expose more of the bosh walls to the cooling action of the atmosphere. The bosh walls are of fire-brick, 30 inches thick, and each course is secured by bands of one inch square iron, extending from one housing to another, into which they are secured by means of slots and T heads. The short space permits the use of light irons, which cover but a small portion of the brick work. The housings support a hollow mantle which allows of a free circulation of air, and also carries in openings cast in the web the blast- water- and spray pipes, in such manner as to require but short pipes, and have them so exposed as to be readily examined.

The crucible walls up to the level of the tuyere arches, are surrounded by a casing of plate iron, allowing space for six inches of washed gravel, through which water can be permitted to percolate.

A spray pipe runs underneath the mantle and can be made to play against the bosh walls and cool them when required. The upper portion of the stack is built of red brick and lined with fire-brick, with the usual loam spaces between them. The red brick is secured by bands encircling the stack, having improved double clevices.

The top of the stack has the usual iron casing, with opening for the down take, and is covered with cast iron plates, secured by countersunk washers, making an even-sectional floor, which can be readily removed at any desired po nt. The railing is constructed of cast posts and bar iron rails, arranged so as to receive sheets of metal; thus making the fence either open or close, as required by the weather. The tunnel head is fitted with WEIMER'S Patent Furnace Charger.



IMPROVED CALCINING KILN.

A wind turbine has been patented in Denmark. It is said to work in a much lighter breeze than the ordinary style of wind-mill, and to be well suited to a variety of industrial uses.

The Reading Company's Form of Agreement with the Furnace Companies.

THIS AGREEMENT, made this.... day of.....A. D. 1875, between .....hereinafter styled the party of the first part, and the PHILADELPHIA AND READING COAL AND IRON COMPANY, hereinafter styled the party of the second part, witnesseth, that it is hereby agreed between the said parties as follows:

First. That the party of the first part shall forthwith cause ..... furnace known as ..... situated at.....to be made ready for the manufacture of pig iron; and that so soon as the said furnace shall be ready for operation .....shall manufacture thereat into pig iron, for the party of the second part, with all possible dispatch, all the iron-ore, coal, and limestone which the party ot the second part shall furnish for such manufacture, to the exclusion of the use of the said furnace and its appurtenances for any other purpose.

Second. That the admixture of the ores to be used in said manufacture shall be exclusively regulated by the party of the second part; and that the directions given by its agent in the premises shall be implicitly followed by the party of the first part.

Third. That the said furnace, its scales and all other appurtenances, and all books, accounts, and papers connected with the operation with the said furnace and its appurtenances, shall at all times be subject to inspection and examination by the agent of the party of the second part.

Fourth. That the party of the second part shall furnish in cars or boats, on the siding or sidings or at the wharf or wharves used or intended for the delivery of such articles, sufficient quantities of ore, coal, and limestone to keep the said furnace in operation during the term of this contract, unless when the furnishing of the said articles shall be prevented or delayed by derangement or obstruction of railroad or canal transportation or by labor strikes or other interferences with the production or transportation of the said materials; that the said boats and cars shall be unloaded with all possible dispatch by the party of the first part at.....own expense, and for any delay in unloading the same, the party of the first part shall be chargeable with the fines or sums charged for the detention or demurrage of the said cars or boats,—the party of the second part reserving to itself, at the same time, the option of having the said cars or boats unloaded at the expense of the party of the first part in case of any improper delay on the part of the party of the first part in the premises; it being clearly understood and expressly agreed that all the coal, ores, and limestone thus furnished shall at all times, as well during the process of conversion into pig iron, as before, and also the pig iron produced therefrom shall be the absolute and unqualified property of the party of second part exclusively, and that the party of the first part shall not have any ownership, interest, or lien therein or thereon.

Fifth. That the party of the first part shall load on the cars or boats sent by the party of the second part the pig iron manufactured as aforesaid as soon as the same shall have been manufactured, dividing the said iron into the several grades known in the trade as "No. 1," "No. 2," "No. 3," "Mottled," and "White," and keeping each grade separate and distinct in the loading; and that the party of the second part shall c use the said boats or cars, when thus loaded, to be removed from the said furnace as promptly as may be consistent

with the facilities for canal or railroad transportion available at the time to the said party of the second part, and shall, with all reasonable dispatch, cause the same to be inspected and re-graded as aforesaid by the person or persons to whom the said party of the second part shall intrust the said duty, whether such person or persons shall be in the regular employment of the said party of the second part or shall be selected by the said party of the second part for the said special service; and the decision of the said inspector or inspectors, as to the grade of the said iron, shall be absolutely final and conclusive upon the parties hereto.

Sixth. That the party of the second part shall pay to the party of the first part, for.....services in manufacturing into pig iron the materials furnished by the party of the second part, as follows:

For pig iron re-graded as aforesaid as No. 1, the sum of.....dollars for each ton of twenty-two hundred and forty pounds weight of the said pig iron.

For pig iron re-graded as aforesaid as No. 2, the sum of.....dollars, for each ton of twenty-two hundred and forty pounds weight of the said pig iron.

For pig iron re-graded as aforesaid as No. 3, the sum of .....dollars for each ton of twenty-two hundred and forty pounds weight of the said pig iron.

For pig iron re-graded as aforesaid as "Mottled," the sum of.....dollars for each ton of twenty-two hundred and forty pounds weight of the said pig iron.

For pig iron re-graded as aforesaid as "White," the sum of.....dollars for each ton of twenty-two hundred and forty pounds weight of the said pig iron: *Provided, however,* that in determining the weight of each of the aforesaid grades of iron, a proper allowance shall be made for "sandage," and that the extent or amount of the said allowance shall, in all cases, be determined by the aforesaid inspector or inspectors of the party of the second part, whose decision thereon shall be final and conclusive on the parties hereto; the said payments to be made on the tenth day of each month succeeding the date on which the report of the inspector or inspectors shall have been made, and to include the pig iron specified in the said report.

Seventh. That the said party of the first part shall exercise all proper care and skill in the manufacture of the said pig iron, and shall be responsible to the party of the second part for any damages or loss which may result to the said party of the second part through or in consequence of the omission of the party of the first part to comply with this requirement.

Eighth. That the party of the second part shall have the right to pay any wages which may be due and unpaid to persons who have been employed by the party of the first part in the manufacture aforesaid, and to recover the sums thus paid from the party of the first part, either by deducting the said sums from whatever compensation may thereafter become due to the party of the first part, as hereinbefore provided, or otherwise—the party of the first part hereby agreeing to reimburse to the party of the second part the sums thus paid: *It being understood and specially agreed, however,* That this right of paying wages as aforesaid shall be exercisable only at the option of the party of the second part, as a means of securing the continuance of the manufacture herein contracted for; and that nothing herein contained shall be construed as expressing or implying any obligation on the part of the party of the second part to pay the said wages, or any part thereof, under any circumstances whatever.

Ninth. That this contract shall take effect on the .... day of.....A. D. 187.. and shall continue in force for the term of... ..year thereafter: *Provided, however,* That if the party of the first part shall, for the purpose of using..... furnace for the manufacture of iron otherwise than under this contract, elect to terminate this contract.....may, at any time after the expiration of three months from the time when the said furnace shall have been put into successful operation under this contract, give the party of the second part written notice of.....wish that the term of the said contract shall cease and be at an end, and at the expiration of.....days from the service of the said notice upon the party of the second part, the term of this contract shall cease and be at an end: *It being understood and expressly agreed,* That the said contract shall not be terminated by such notice when it shall have been given merely for the purpose of enabling the said party of the first part to put the said furnace out of blast; and the party of the first part putting, or voluntarily permitting, the said furnate to be put out of blast within the period of.....days after the said party of the first part shall have discontinued the manufacture of iron under this contract, shall be *prima facie* evidence of the said notice having been given merely for the purpose of putting the said furnace out of blast: *And provided further,* If at any time during the term of this contract the said furnace shall, in the opinion of the agent of the party of the second part, charged for the time being with the duty of inspecting the manufacture hereby contracted for, be working wastefully—that is to say, not yielding a product of fair average quantity and quality, the said agent of the party of the second part, charged with the supervision of the said manufacture, may serve a written notice to that effect upon the party of the first part, either personally or by leaving the same at the office or place of business appertaining to the said furnace; and if at the expiration of one week from the date of the service of the said notice the wasteful working of the said furnace shall not, in the opinion of the agent aforesaid, have been effectually remedied, the said party of the second part may request the president for the time being of the American Iron and Steel Association of the City of Philadelphia, or, in his absence, the acting president of the said association, to appoint an expert to examine the said furnace; and if such expert, when appointed, shall, on examination of said furnace, report, in writing, that the said furnace is working wastefully—that is to say, not yielding a product of fair average quantity and quality, and that the said wasteful working is not owing to any defect in the quantity or quality of the materials supplied by the party of the second part, or to any direction given by the party of the second part as to the admixture of the ores being smelted at the said furnace—the party of the second part may at its election, by written notice to the party of the first part, served as aforesaid, terminate this contract; and upon such notice being served this contract shall at once be terminated.

Tenth. That at the expiration of the said year, or at the sooner determination of this contract, as above provided, the party of the first part shall at once purchase from the party of the second part all the coal, ore, and limestone belonging to the party of the second part then on hand at the said furnace, whether the same shall be intact or shall be in process of manufacture, including the contents of the stack; and if there shall be any disagreement between the parties as to the value of the same, the said values shall be determined by the award of the referees hereinafter provided for, and upon the payment of the said value by the party of the first part, the said materials shall become the property of the party of the first part, and the party of the second part shall cease to have any further ownership of the same. And for the better securing the payment of the said sum when the same shall have been agreed upon by the parties hereto, or determined by the award of referees as aforesaid, the party of the first part does hereby authorize and empower any attorney of any court of competent jurisdiction to agree as.....attorney to the entry of an amicable action by the party of the second part against the party of the first part, or to appear as the attorney of the party of the first part to any suit to be brought by the party of the second part against the party of the first part, and either in the said action, or in the said suit, to confess judgment against the said party of the first part for the aforesaid sum, together with interest thereon, for which this shall be the said attorney's lawful and sufficient warrant, on which judgment execution may forthwith issue, without any stay whatever; and the said party of the first part does hereby waive, remise, and release unto the said party of the second part, its successors and assigns, all and all manner of errors, misprisions, misentries, defects, and imperfections whatever in the said proceedings, or in any proceedings whatever thereto relating or therewith connected: *Provided, however,* That the party of the second part may, at its option, in the event of the party of the first part failing to pay the value of the aforesaid materials immediately upon the said value having been agreed upon or determined as aforesaid, take the exclusive possession of the said furnace and its appurtenances, and all the tools, implements, and apparatus pertaining thereto, and use the said furnace and its appurtenances, and the said tools, implements, and apparatus in and for the manufacture or completion of manufacture into pig iron of the aforesaid materials belonging to the party of the second part then on hand at the said furnace, whether the said materials shall be intact or in process of manufacture, including the contents of the stack; and the expense incurred by the party of the second part in manufacturing or completing the manufacture of the said materials into pig iron, and in loading the said pig iron on cars or boats, shall be deductible from the sum to which the party of the first part would have been entitled for the manufacture of the said iron if the same had been manufactured by.....under this agreement, and only the surplus, if any, shall be payable to the party of the first part.

Eleventh. That any and every question, controversy, or dispute which may arise between the parties hereto as to the true intent and meaning of this contract, or as to any duty or liability of either party thereunder, whether proceeding from acts or omissions, including therein all claims for damages resulting from the alleged non-performance of the said contract or any part thereof by either party, shall be referred to and decided by three disinterested men, one to be chosen by each of the parties hereto, and the third by the two previously chosen; and the decision of the said referees, or any two of them, shall be absolutely and finally binding and conclusive upon the parties: *Provided,* That if either party, after having been notified in writing of the desire of the other for a reference, the name of the referee chosen by the said party, and the subject matter or matters of the reference, shall delay for more than three days after the receipt of the said notice, to choose another referee, then the president for the time being, or, in case of his absence or inability to appoint, the acting president for the time being of the American Iron and Steel Association of Philadelphia, shall appoint another referee, and the two referees thus selected shall choose a third; and if the two referees chosen in either manner aforesaid shall neglect or be unable, for the period of five days, to choose a third, the third referee shall be selected by the said president for the time being, or, in case of his absence or inability to appoint, by the said acting president, and their decision, or that of any two of them, shall be absolutely and finally binding and conclusive as aforesaid, and in any case the reasonable charges and expenses of the referees shall be paid, as the said referees or a majority of them shall award: *Provided, however,* That if the subject-matter of the said reference shall include a claim by the party of the second part for the payment to be made by the party of the first part, in accordance with the provisions of the section of this agreement numbered "tenth," the award thereon shall be made separately and distinctly, so that the same may be at once enforced, as hereinbefore provided.

In Witness Whereof.....

Sealed and delivered in our presence:.....

Notes.

The Morganza Water Works, Pittsburgh Pa.—The managers of the State Reform School have awarded the contracts for pipe and pipe laying and for the construction of the reservoirs at the Morganza farm. The contractors in both cases supply all material, labor, etc. The bid of WM. PAUL, Jr., late Superintendent of the Allegheny Water Works, for the pipes of all sizes, together with the necessary valves and plugs, was accepted. There will be about 8,000 feet of pipe in all. The figures are as follows: Six inch pipe $1 05 per lineal foot; five inch, ninety-three cents; four inch, seventy-five cents; two inch, fifty-five cents. Six inch valves, twenty-one dollars and fifty cents each; five inch, twenty dollars; four inch, fifteen dollars; two inch, eleven dollars; fire plugs, thirty-eight dollars and fifty cents. The highest bid was: For six inch pipe $2 75; six inch valves, forty-four dollars; fire plugs, seventy-five dollars; smaller sizes of pipe and valves in proportion. The price to be paid Mr. PAUL is as low as the work could be well done for, the rate per foot of six-inch pipe, including the laying, being about four cents per pound. There will be two reservoirs, each fifty by thirty-five feet, and fifteen feet in depth. This will give a total capacity, allowing twelve of water, of about, 300,000 gallons. The contract has been let to McCANN & DAWSON, of Steubenville, Ohio, at eighteen cents per yard for excavation, $3 75 per cubic yard for stone work, and seven dollars per cubic yard for masonry in the main hole.—*Pittsburgh Commercial.*

Hydraulic Lifts for Canal Vessels.—The trustees of the River Weever Navigation recently attended the formal opening of a hydraulic lift for vessels, which forms a new and most important improvement in canal navigation. The site of this new invention is at Anderton, England, where the Trent and Mersey Canal approaches the river Weever. There is already a considerable trade passing from the canal to the river at Anderton, proceeding from the iron and pottery districts to the sea at Liverpool; but, as the canal is over 50 ft. above the river, the whole of this trade has hitherto been subject to transhipment, which necessarily involves a great expenditure upon labor. The object of the trustees has been to raise the river vessels at one sheer lift up to the level of the canal, and to lower the canal vessels by the same means to the river, thus establishing as complete intercommunication between canal and river as if no difference of level existed. They have accordingly formed an extension of the canal in two branches towards the river, in wrought iron, and adjacent to these, and capable of direct water communication between them, have placed a double lift, which takes the vessels up and down by means of hydraulic power actuated by steam. The lift consists of two large wrought iron tanks, or open pontoons, situated side by side, and each of equal section with the canal, and of a length sufficient to receive the longest of the vessels which navigate the canal. One pontoon ascends while the other descends, the time occupied in making the ascent and descent being, on an average, only about three minutes. Each pontoon is fitted with ends that lift up when connexion has to be made with the canal or the river, thus allowing a free passage for the vessels out of or into either. These lifting ends, and the junctions of the pontoons with the iron branches of the canal, are all made perfectly watertight by means of very ingenious arrangements of india-rubber packings, which are brought into operation by the motions of the lift and the pressure of the water.

The Swansea Silver Smelting and Refining Works of Chicago.*

By J. L. JERNEGAN, JR., M. E.

CONCLUDED FROM PAGE 212.

SMELTING OF THE ROASTED ORE IN BLAST-FURNACES.

THE principal ingredient of the roasted ore is silicate of lead, and the object of this operation is the reduction of the lead to the metallic state, concentration of the silver in the same, and separation of the oxides more difficult of reduction in the form of a slag. It is desirable that the slag should approach in chemical composition as nearly as possible to that of a singulo silicate. Some little matte is found, the amount depending, of course, upon the thoroughness with which the preceding operation of roasting has been conducted. Generally speaking, it is quite poor, both in silver and lead, its chemical composition often nearing that of a pure proto-sulphide of iron, since metallic iron is freely employed as a precipiting agent for the lead, and the formation of an easily fusible slag. Limestone is used as a flux when deemed necessary, also slag from the same operation. Connelsville coke is the fuel.

There are two blast-furnaces in which this operation is conducted, only one, however, is in blast at a time. They have four tuyeres each, cooled by water, and are provided with the siphon tap. The blast is supplied by a No. 9 Sturtevant blower. Figs. 3, 4, 5, and 6 represent the furnace in front elevation and in several sections. The following are some of the principal dimensions :

	Ft.	In.
Height of dam-plate from foundation	2	0
" feed hole " "	11	6
" from center of tuyeres to feed hole	9	0
" tuyeres from foundation	2	3
" tuyere nozzles above slag-flow	0	6
Diameter of tuyeres (inside measurement)	0	2½
Distance from back wall to breast at tuyeres	2	8
" between side walls at tuyeres	1	10
From center of tuyeres to bottom of hearth	2	0
Hearth projects beyond hearth wall	0	8
Width at throat (square)	2	8
" of upper portion (square)	4	0
Total height from foundation to top	27	0

It will be seen, on inspection of the cuts, that the hearth of the furnace is well secured by four cast-iron plates, and the shaft by upright angle irons securely fastened at top and bottom with bolts passing through the flanges. There are also horizontal cross pieces, about half way between foundation and feeding hole. Both furnaces connect with a chimney 105 feet high by means of long sheet iron pipes, which collect a considerable portion of the fumes coming from the furnaces.

Before starting the furnace it is heated for several hours by keeping up a fire with charcoal on the hearth bottom, the lead-well is then filled with hot coals, and a gentle blast is forced down through one of the tuyere nozzles into it, and from thence through the pipe connecting with the hearth into the furnace. The shaft is now filled to the height of 5 or 6 feet with charcoal, and, after having become well ignited, about 20 bars of bullion are put in at the feed hole. It soon melts and flows into the hearth and rises up into the lead-well. A slight blast is put on soon after this and regular charges of coke and small quantities of roasted ore and fluxes are added, and the two latter gradually increased until the furnace is receiving its full amount, and working under its normal pressure of blast.

The average campaign lasts about 10 days, the longest was 14 days. The greatest difficulty experienced is the rapid burning out of the furnace lining, hence the short duration of the campaigns.

Why not make up the charges so as to form a more highly silicated slag, and thus avoid this difficulty? The answer is, the furnace would not work as quickly, and produce bullion as rapidly, as those having the chief interest in the works desire, if the amount of the basic fluxes were to be reduced.

The slag runs continually from the furnace into an iron slag-pot mounted on wheels, which, when full, is drawn away, and another brought into requisition. It generally runs thin and cools rapidly with turgescence, and the bubbles, on bursting, frequently emit blue gaseous flames. After solidification, it has a feeble metallic lustre, and is black in color. What little matte is found flows out with the slag and settles to the bottom of the slag-pot, provided the latter is not of too high a specific gravity to allow of a good separation. I mention this, as a case of this kind actually occurred after having used the same slag as a flux several times in succession, not having any other on hand, which, finally, by its repeated passage through the furnace, became so saturated with iron, that its specific gravity was materially increased, leaving but a slight difference between it and that of the matte. As a very natural consequence, the slag assayed high both in silver and lead, owing to the imperfect separation.

The average pressure of blast is equal to one half-inch mercury column, the blower making about 1800 revolutions per minute. The charges are not made up in large quantities in layers on the charging floor; but roasted ore, scrap iron, limestone, slag and coke, are all dumped in separate heaps near the feeding-hole; the feeder shoveling the different material into the furnace in such proportions to each other as directed by the superintendent. Neither is anything weighed, though the weight of a shovelful of the various fluxes, ore, and fuel, are approximately known. Ore, fluxes, and coke are spread as equally as possible over the entire area of the shaft, unless deviation from this rule becomes necessary from some irregularity in the working of the furnace.

The coke is from Connelsville, Pa., and costs from $6 to $7 per ton; the scrap

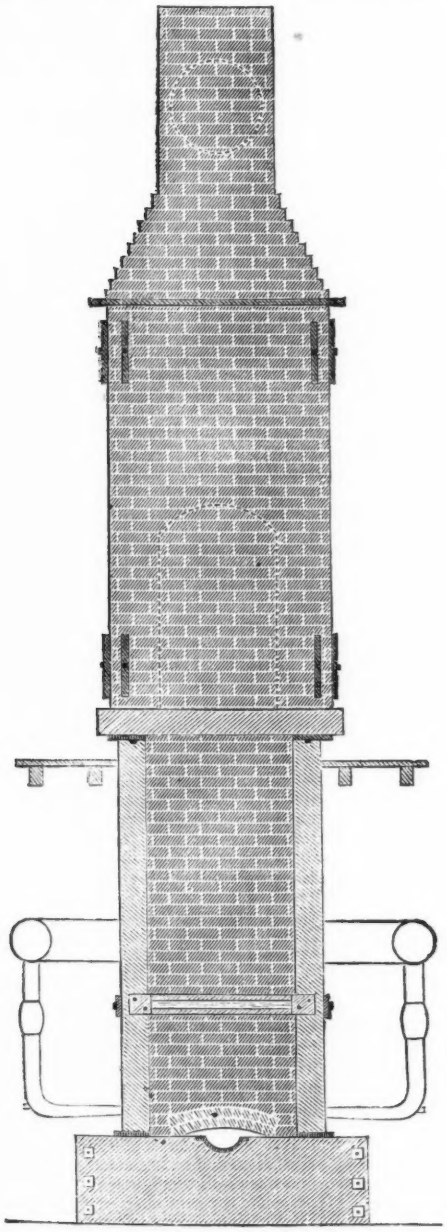


Fig. 3.—Front Elevation.

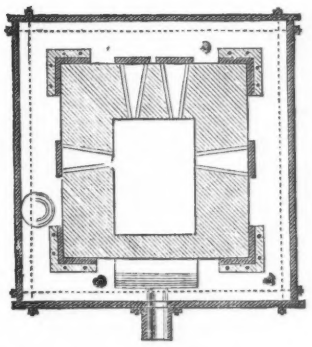


Fig. 4.—Horizontal Section through E F.

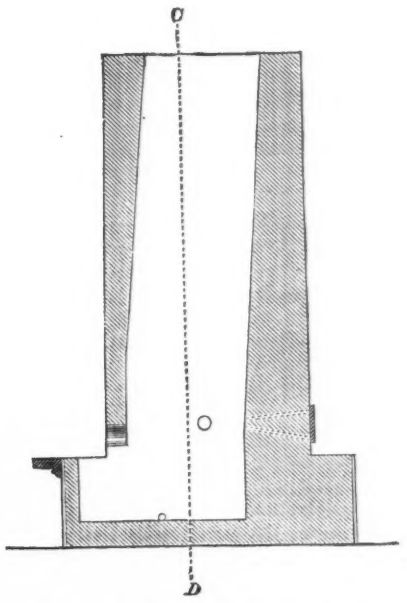


Fig. 5.—Vertical Section through A B.

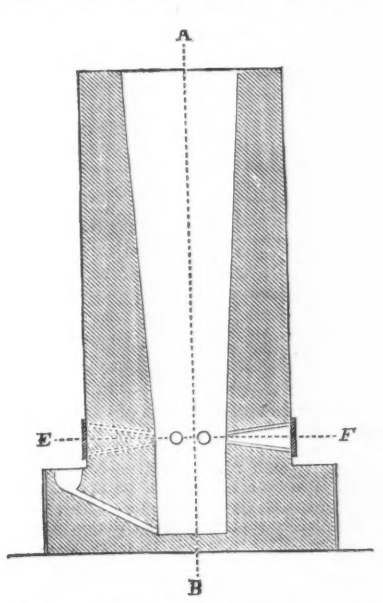
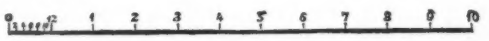


Fig. 6.—Vertical Section through C D.



Scale 1 ft. = 0.25 in.

* A paper read before the American Institute of Mining Engineers, at the Dover Meeting, May, 1875.

iron (old cans, clippings from tinsmith shops, etc., etc.), between $4 and $5 per ton; limestone (sometimes oyster shells are employed) from the quarries near the city costs about $1 per ton. It may be mentioned in this place that good fire-brick can be procured for about $50 the thousand.

There are five workmen engaged about the furnace: the head smelter, at $1.80 per shift of 12 hours; two slag runners, at $1.50 each; one feeder, at $1.75; and a roustabout at $1.50.

The capacity of the furnace running on the ores enumerated in the first part of this paper may be stated at from 10 to 15 tons when previously roasted and slagged, with an average yield of from 5 to 7½ tons of bullion per 24 hours; as much as 20 tons, however, have been smelted in the same time.

I give here a single example of the composition of the charges; it was seldom that they ever varied when there was a full supply of roasted ore on hand. The roasted ore contained about 60 per cent. lead and 15 oz. silver to the ton.

BLAST FURNACE CHARGE.

Roasted ore,	6	shovels	@ 13 lb.	= 65 lb.	= 51.18	per cent.
Iron scrap,	3	"	@ 3⅓ "	= 10 "	= 7.87	"
Limestone,	½	"	@ 10 "	= 5 "	= 3.93	"
Slag,	3	"	@ 11 "	= 11 "	= 25.98	"
Coke,	1	"	@ 14 "	= 14 "	= 11.02	"

Amount of fuel consumed, according to the above, is equal to 12.38 per cent. of the total amountof roasted ore and fluxes composing the charge, or 21.53 per cent. of the roasted ore.

Sometimes considerable annoyance was experienced by the deposition and accumulation of metallic fumes on the walls of the furnace, from two to three feet below the throat which, at the end of nine or ten days after blowing in, frequently formed a complete circle, leaving only a small annular space in the center for the passage of the charges. This only happened to any great extent, however, when raw ores were introduced into the furnace for want of a sufficient supply of roasted ore, and since the former were mostly carbonates or oxidized ores, the formation of accretions in the upper part of the furnace is easily explained by the condensation of the volatile compounds of carbonate and oxide of lead on the cooler portion of the furnace walls. Another circumstance conducive to the formation of metallic fumes, is undoubtedly the small vertical distance from slag-flow to tuyere-nozzles, which is only six inches, whereas it should be at least ten, otherwise lead will invariably be volatilized in large amounts. Probably the best method of getting rid of such accretions, after they have once formed, is to discontinue the charges, allow the smelting column to sink down several feet, throw in several billets of dry wood, and then, with the aid of iron bars and the intense heat produced by the burning wood, the accretions are partly melted and partly pried off; after which the charging begins again.

The products of this operation are:

Slag. Sometimes quite free from lead; the average result obtained by fire assay may be put at about 2 per cent. When not containing much more than this amount, it is thrown away, with the exception of a small portion retained for fluxing material. There has been only one complete analysis made of the slag; it is given below. The sample selected for analysis had all the appearance of being a fair type of the slag generally produced at the works. The deficiency shown is probably due to my not having determined the sulphur, which was no doubt present in the form of matte.

ANALYSIS OF BLAST-FURNACE SLAG.

				Oxygen.
SiO_2	= 33.755 per cent.			17.79 acid.
Al_2O_3	= 13.000 "		7.60	
FeO.	= 40.665 "		9.04	=19.56 bases.
CaO.	= 9.567 "		2.73	
MgO.	= 0.226 "		0.09	
MnO.	= trace. "		=11.96	
PbO.	= 1.468 "	= 1.363 Pb....	0.10	
	98.301			

The oxygen of the bases of the RO type amounts to 11.96; of the bases of the R_2O_3 type it is 7.60, and that of the silicic acid 17.79. The sum of the oxygen of both types of bases is 19.56. This gives the ratio of 19.56 : 17.79 = 1.09 : 1, or nearly as 1 : 1. The slag, consequently, very nearly approaches a singulo silicate in its composition. Since the oxygen of the bases of the RO type is to that of the R_2O_3 type as 11.96 : 7.60, the composition of this slag may be approximately represented by the formula,

$$2Al_2O_3, 3SiO_2 + 2RO,SiO_2.$$

Matte.—Quite often almost a pure proto-sulphide of iron, then again containing lead and silver in considerable amounts; the amount produced depending entirely, of course, upon the thoroughness with which the ore has been roasted previous to smelting. Average contents in lead from 5 to 15 per cent., and in silver from 7 to 10 oz. to the ton. When containing much over 5 per cent. lead or 2 to 3 oz. silver, it is separated from the slag, crushed, mixed with the ore roasting charges, roasted and again put through the blast furnace.

Speiss.—Occasionally produced in very small quantities. It is thrown away.

Wall accretions.—They are smelted raw in conjunction with the regular charges in the same furnace.

Fumes.—All but the small portion settling in the pipes leading from the furnaces to the chimney is lost. The small amount saved is mixed with the roasting charges, and then passed through the blast-furnace after roasting.

Bullion.—Containing from 20 to 90 oz. silver per ton. Average of 25 assays of samples carefully taken from every bar produced from Aug. 24th to Oct. 1st, 1874, 31 89-100 oz. When assaying much lower than 90 oz. it is not desilverized, but sold to other works in the city where bullion of a higher grade is being produced. In order to give some idea of the rate at which bullion is produced, the following may be cited: From Aug. 24th to Oct. 1st, (37 days intermittent work) there were produced 420,264 lb.=210 132-2000 tons of lead, containg 6853 oz. silver with some little gold.

The bullion when refined and parted at the works is, with the exception of a few slight modifications, treated in accordance with the Balbach process. It is not my design to describe this process here, since I have already treated of the subject in a former paper to the Institute.

From last accounts the Swansea Works are now standing idle; it is to be hoped that operations will soon be resumed. Thus far, of the five smelting works in and near Chicago, none have had any very decided success. The causes to which this is attributable are various and many, and to fully explain them, would take me beyond the proposed limits of this paper.

NEW PUBLICATIONS.

We are indebted to the courtesy of C. LE NEVE FOSTER, Esq., H. M. Inspector of Mines, for his report on the mines classed under the Metalliferous Mines Regulation Act, in Cornwall, Devonshire, Dorsetshire, and part of Somersetshire, for 1874. Also for his papers read before the Royal Geological Society of Cornwall, on the Lode at Wheal Mary Ann, in Cornwall; and on the Place and Occurrence of the rare Mineral Andrewsite.

CORRESPONDENCE.

TO THE EDITOR: Sir—A note in your issue of August 21st contains the statement that "The New York Belting and Packing Company has gained its suit against the Gutta Percha and Rubber Manufacturing Company, for infringement of a patent granted in 1859 to THOMAS J. MAYALL, of Boston, on the use of crude carbolic acid as a preservative of the canvas used in making rubber hose, etc.," with some severe insinuations concerning the administration of the Patent Office.

As a party fully informed of the facts, I would say on behalf of the Gutta Percha and Rubber Manufacturing Company, that the article in question contains several important inaccuracies, as follows:

First. The New York Belting and Packing Company has not gained its suit against the Gutta Percha and Rubber Company, that case not yet having reached a hearing, through delays for which the Gutta Percha and Rubber Manufacturing Company are not responsible.

Second. The patent granted to THOMAS J. MAYALL, in 1859, was not on the use of carbolic acid, but on dead oil of tar, and some other substances, at least one of which (corrosive sublimate) would destroy, instead of preserve, the fabric.

The patent was found to be useless, and not until a few years since, when, under later patents, the Gutta Percha and Rubber Manufacturing Company had demonstrated the real value of carbolic acid in the manufacture of their hose, was it thought of. Then the rival company sought its re-issue under such form as to include carbolic acid. The Examiner rendered an opinion favorable to such re-issue, but the Board of Commissioners, on appeal, reversed this decision, and decided such issue improper. The Commissioner of Patents sustaining the Board, the New York Belting and Packing Company applied to the District Court of Columbia, and on an *ex parte* hearing obtained an order for the re-issue of the patent.

It is accordingly issued by the Patent office, accompanied, however, by an earnest protest from the Commissioner setting forth the facts.

The correctness of this statement the counsel of either Company will admit.

G. S. D.

THE *note* referred to was based on information which we thought, at the time, reliable. We regret having been led into any assertion which may not have been correct, and give place to our Correspondent, "G. S. D.," who makes the above corrections.—[ED. E. AND M. J.

Eames Furnace—Correction.

No. 12 HUDSON TERRACE, HOBOKEN, Aug. 20, 1875.

TO THE EDITOR: SIR—It has become my duty to point out, in my Report upon the EAMES Petroleum Furnace, which you have so kindly printed and favorably noticed, some errors of figures in the following passage, which it is difficult now for me to understand how I could have been guilty of:

"The temperature of the chimney-gases, after passing the boiler, was on this day lower than usual, ranging from 320° to 330° Fahr., indicating, doubtless, a lower initial temperature of the fire-space than previously, due to the increasingly bad condition of the furnace. The temperature of the air having been 80°, the proportion of the total heat produced, that was being utilized and saved in this furnace, is easily calculated. Taking 3300° as the maximum heat, and 325 as that of the chimney, this proportion is equal, by an obvious formula, to:

$$\frac{3300-325}{3300-80} = .9239$$

or 92.30 per cent. of the total heat, as the saving in this operation. This is a very large proportion. If we now, in round numbers, allow 10,000 Centigrade units as the total caloric capacity of the oil, from DEVILLE'S actual determination = 18,000 Fahrenheit units; we can easily calculate how much *steam* should be made by this furnace, when carrying also its full load of iron; that is, if we make one arbitrary allowance of 5 per cent. loss for one small unknown factor, namely, the sum of the latent heat of fusion and specific heat of the *slag*. In this case, we have no allowance to make, as with coal, for imperfect combustion and specific heat of ashes and cinders. 200 lb. of oil per hour=a total heat of 3,600,000 Fahr. units; 92.39, minus 5 per cent. for the slag, or 87.39 per cent. of this=3,146,040 units. The specific heat of iron being taken at .112, to heat the 3,000 lb. of iron to 3,000°, [*should read* 2,000°] takes 336,000 [*should read* 672,000] units, and there is left for steam 2,810,040 [*should read* 2,374-040] units per hour. Taking the heat of steam from water at 80° F.* as 1148 units, there must be 2447 [*should read* 2068] lb. of water converted into steam per hour; or, assuming 1 lb. best anthracite burned directly under the boiler equal to making 8 lb. of steam, we have here in the waste heat of one petroleum furnace, heating also 3,000 lb. iron, the equivalent of 306 [*should read* 258.5] lb. of coal burned per hour, or, 408 [*should read* 344.5] lb. every 80 minutes, *directly under the boiler*. It is no wonder, then, that *with one furnace* the result, so surprising at first sight, is obtained of steam got up every 80 minutes for running six large boiler-plates through the heavy rolls. It is fair to remark that to do this required *two* coal furnaces, the rolls and fly-wheels being much *out of level* and running very hard. These figures are very satisfying, as they *fit well* with the actually observed work of the oil, and amount to a chemical and mathematical demonstration of the immense value of this invention."

While the correction of these errors really modifies but little the conclusions drawn, yet as there is an unnecessary exaggeration in favor of the oil, as against coal, involved in them, it would be wrong to let them stand. Respectfully

HENRY WURTZ.

Lancashire Spiegeleisen.—A new branch of industry in connection with the iron trade is just being opened out in Lancashire, and as it will assist in making English manufacturers independent of Germany, its development will be watched with interest. Already in one or two of the other British ironmaking districts the manufacture of spiegeleisen has been commenced, and this has now been followed by the Darwen Iron Company, who are producing spiegeleisen of a very high quality, the analysis showing a percentage of manganese varying from 12 to 16. This is considerable higher than that contained in the German productions, and the spiegeleisen is otherwise of remarkably good quality.

STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative Statement for the week ending Aug. 28:

	1875.		1874.	
	Week.	Year.*	Week.	Year.
Wyoming Region.				
D. and H. Canal Co	41,741	2,065,164	31,223	1,521,004
D. L. and W. RR. Co.	68,978	2,272,881	39,880	1,589,700
Penn. Coal Co	29,859	8,8,450	31,019	847,334
L. V. RR. Co.	21,914	597,002	12,954	640,145
P. and N. Y. RR. Co.	1,749	72,923	1,158	40,352
C. RR. of N. J.	52,553	677,572	15,768	879,287
Penn. Canal	15,532	128,632	11,788	207,c50
Lack. and B. RR.	..	81,493	..	112 529
	232,326	6,769,117	143,790	5,837,401
Lehigh Region.				
L. V. RR. Co	94,514	629,909	62 433	2,049,577
C. RR. of N. J.	23,821	261,793	27,277	690 074
D. H. and W. B. RR.	1,386	48,364	1,562	21,1'9
	119,721	1,140,066	91,272	2,763,820
Schuylkill Region.				
P. and R. R. RR. Co.	176,172	2,221 152	11,c52	3,022,769
Shamokin & Lykens Val.	22,328	788,272	13,915	583.380
	192,500	3,009,424	24,967	3,60',155
Sullivan Region.				
Sul. and Erie RR. Co.	..	5.557	1,c65	24,629
Total	544,547	10,924,664	261,c94	12 231,005
Increase	283,453	..	..	..
Decrease	..	1,307,341	..	..

* Year beginning January 1st.

The above table does not include the amount of coal consumed and sold at the mines, which is about seven per cent. of the whole production.

The following Table does not give the entire production of our Bituminous mines, but it is by far the fullest report published.

The Production of Bituminous Coal for the week ending Aug. 28, was as follows:

Tons of 2,000 lb., except where otherwise designated.

	Week. Tons.	Year. Tons.
Cumberland Region, Md.		
Tons of 2,240 lb	50,941	1,483,573
Barclay Region, Pa.		
Barclay RR., tons of 2240 lb	5,323	145,285
Broad Top Region, Pa.		
Huntingdon and Broad Top RR	3,083	143,045
*East Broad Top	989	29,469
Clearfield Region, Pa.		
*Snow Shoe	563	43,482
*Tyrone and Clearfield	17,734	538,911
Allegheny Region, Pa.		
*Pennsylvania RR	3,179	248,273
Pittsburgh Region, Pa.		
*West Penn. RR	4,435	136,431
*Southwest Penn. RR	220	5,881
*Penn. & Westmoreland gas coal, Pa. RR.	22,274	4c6,411
*Pennsylvania RR	10,081	260,860
Kanawha Region, W. Va.		
*Chesapeake and Ohio RR	4,480	104,993

* To Aug. 21.

The Production of Coke for the week ending Aug. 21.

Tons of 2000 lb.	Week. Tons.	Year. Tons.
Tyrone and Clearfield	..	273
Alleghany Region	..	53
West Penn. RR.	572	32,788
Southwest Penn. RR.	11,815	331,722
Penn. & Westmoreland Region, Penn. RR.	440	21,105
Pittsburgh, Penn. RR.	2,472	65,750
Total	15,299	454,691

Bituminous Coal Production to Aug. 1st, 1875.

The following does not include the total production, but such quantities as have been reported to this office:

Pennsylvania	5,843,076
Ohio	380,188
Maryland	1,434,098
Illinois	484,673
Indiana	28,177
Iowa	52,094
Wyoming	80,346
West Virginia	96,038
Tennessee	57,128
Alabama	35,545
Colorado	12,304
	8,503,867

The receipts at Port Richmond for the week were 70,000 tons, shipments 65,000 tons, and balance on hand 70,000 tons.

The decrease of shipments of Cumberland Coal over the Cumberland Branch and Cumberland and Pennsylvania Railroads amounts to 70,089 tons.

The Exports of Coal from Baltimore for the week were 000 tons, and for the year, 28,476 tons as compared with 60,098 tons to the corresponding time in 1874.

Belvidere Delaware RR. report:	Week.	Year 1875.	Year 1874.
The receipts of coal at Coal Port (Tr'ton)	8 748	64,655	182 134
" " " South Amboy	14,539	107,619	430,490
Shipments of Coal Port (Trenton)	9,536	62,555	184,110
" South Amboy	13,492	164,053	416,662

Receipts of coal at Boston, for week ending Aug. 27, and year from September 1st, 1874.

From	Week. Tons.	Previously Tons.	1874. Tons.
Alexandria	2,908	81,839	87,517
Georgetown	220	24,875	25,264
Philadelphia	28,553	493.827	597,108
Baltimore	3,180	166,797	243,905
Other places	6,632	249,139	210,696
Great Britain	613	2,784	4,146
Nova Scotia	2,212	28,583	80,004

Shipments from Pictou, N. S., for the week ending July 21:

	Tons. Week.	Year.
To United States	1,241	14,461
" West Indies	—	1,107
" South America	—	1,002
" Canada	7,912	86.883
" Other Provinces	2,8c8	29.007
	11,955	132,465

Shipments from the Block House, Cow Bay, C. B. to the following destinations, from Aug. 12 to Aug. 23, 1875:

	Week.	Year.
Provinces	548	4,924
West Indies	—	8c6
United States	744	5,c66
	1,291	10,8c6

COAL TRADE REVIEW.

Duties.

Anthracite free, *Bituminous*, per ton of 28 bushels, 80 lb. to the bushel, 75c., gold.

All *slack*, or *culm*, such as will pass through a half-inch screen, per ton of 28 bushels, 80 lb. per bushel, 40c. gold.

Not otherwise provided for, per ton, 40c. gold.

NEW YORK, Friday Evening, Sept. 3, 1875.

Anthracite.

As is usual at the opening of the month, the demand has fallen off for all descriptions, excepting Lehigh and a few special coals. There are considerable stocks with several of the large companies, and the out-put is, of necessity, being reduced. Concessions are being made in prices by many of the dealers although we are unable to learn of any being made by the companies, excepting in cases where the Delaware and Hudson Canal Company are meeting the prices of the Pennsylvania Coal Company at points above Rondout; and concessions in such cases are nominally made on freights for coal carried in their own boats. This, we understand, is in accordance with the privilege granted the former company by the Combination, last year, and does not apply to shipments to other points. At the last meeting of the representatives of the Combination the question of arranging prices to equalize freights was laid over for future consideration, with the expectation that they would equalize themselves; but, instead of such being the case, the difference appears to increase. In consequence, we hear considerable complaint. It is hardly probable, however, that the question will be touched previous to the regular monthly meeting. We hear of several cases where retail dealers have been detected in giving light weight. The names of the parties, however, were withheld, although they well deserve being made public. It is to be hoped that the honest dealers and the companies will push this matter, and break up such rivals. If the companies permit this practice to be carried on, they will eventually have to close their own yards, for the ordinary buyers will not be able to discriminate, and will naturally buy where they think they are buying cheapest.

The Production for the week ending the 28th ult. was 544,547 tons of anthracite coal, as against 548,917 tons for the previous week (a loss, last week, of 4370 tons); and 261,094 tons for the corresponding week of last year, or against last week of 283,453 tons The total production since January 1st has been 10,924,664 tons, as against 12,232,005 tons for the corresponding period of 1874, showing a loss, this year, of 1,307,341 tons. The average out-put for the last nine weeks has been about 550,000 tons per week. The highest production of any one week this year was 638,678 tons for the week ending July 31. Since then the production has rapidly fallen off, until, as is seen above, last week's production was about 100,000 tons less than the highest point reached. On June 26, the production from January 1st, as compared with the corresponding period of 1874, was 3,196,575 tons short. Since then there has been an increase, as compared with last year's production, until the decrease this year is but 1,307,341 tons. From the 1st of September to the 1st of November, 1874, the average production was about 470,000 tons per week. If we could continue even the present out-put, the total production for 1875 would be about equal that of 1874; but the indications are that the Fall demand will not be so great as last year, and that, instead of warranting the maintaining of the present output, the average for the balance of the year will be no greater, and, perhaps, less, than last year. It is quite probable that the decrease in this year's production will reach fully 1,500,000 tons.

Bituminous.

There is nothing new to note in the Bituminous trade. The demand continues light and prices low. The prospects for the Fall trade are not flattering. The Cumberland production for the week ending the 28th ult. was a few hundred tons less than the previous week, although over 7,000 tons greater than the corresponding week of 1874. There was, however a boatmen's strike during the week last year, which delayed shipments. As will be seen by our regular weekly report, the foreign shipments of coal from Baltimore have fallen off more than one-half, and the prospects for large shipments being made later in the season are not encouraging, as English and other foreign coals are being sold so low in foreign markets as almost to exclude our American coals. The shipments of Pennsylvania bituminous coals show a slight falling off in almost every kind.

	Jan. 1 to Aug. 22, 1874. Tons.	Cwt.	Jan. 1 to Aug. 21, 1875. Tons.	Cwt.
Borden Mining	90,479	19	144,184	12
Consolidation	279 454	11	265,91c	13
Blaen Avon	25,16;	08	42,944	13
H. & B. Co.	40 699	c9	36,333	13
" Va. Mines	c8,020	15	60,160	02
George's C. C. & I. Co	189 430	05	110,758	02
N. Central	166,003	02	167,296	14
Maryland	185,707	19	157,982	08
American	141,230	17	116,220	10
Atlantic & G. C.	72,479	14	72,982	04
Piedmont	31,003	19	37,667	12
Swanton	55 308	—	47,354	—
Potomac	51.582	—	50,656	—
George's Creek	46,561	04	52,331	18
Franklin	62,060	04	57,274	10
Virginia	.....	—	7c8	—
New Reading	8,480	16	18,848	14
	1,516,970	02	1,432,632	05

FOREIGN AND GAS COALS.—We are reported the sale of the remainder of the cargo of Australian shale, which arrived here last summer, at $25 per ton. This figure will undoubtedly discourage from similar ventures, as the loss must be quite heavy. Other coals remain exceedingly quiet.

FREIGHTS.—At Georgetown and Baltimore rates are a little weaker; at this port they are more firm on points around the Cape, while Sound ports show a falling off. Philadelphia rates remain without change.

Philadelphia Coal Trade.

PHILADELPHIA, Sept. 2, 1875.

Vessels are quite scarce at this port, and have been for several days past. The freights are stiffening some, in consequence of it, and the full rate of $1 60 is paid to Boston. Although orders are not so plenty, they have accumulated lately on account of the few arrivals of vessels.

The city trade for anthracite is in a very peculiar position. If the Lehigh collieries were able to fill all the orders given for that coal, Schuylkill would have a very poor show. People who have read the argument of Mr. GOWEN, and recollect how advantageous the position of the Schuylkill basins is represented to be in relation to the city of Philadelphia, and note the assertion that this city would be deprived of coal if that avenue did not exist will be much surprised to hear that it costs much less to bring coal to this city by the other avenues which connect it with the anthracite coal region, even when the distances are greater, and the grades of roads not so advantageous. As a consequence, Lehigh Stove costs less than Schuylkill Stove, and the dealers are all turning their attention to Lehigh and Wilkes-Barre coals. A comparison of the rates would strike your readers most unfavorably towards the policy adopted by the Reading, which is fast losing trade, and will find it much harder to regain a position lost than to hold it.

Wholesale Prices of Anthracite Coal for Sept. f.o.b. at the Tide Water Shipping Ports per ton of 2240 lb.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
*Lackawanna and Scranton at Rondout and Hoboken	5 05	5 15	5 25	5 55	6 00	4 95
‡Pittston at Newburgh	5 05	5 05	5 15	5 30	5 80	4 85
Wilkesbarre at Port Johnston.	5 05	5 15	5 25	5 55	6 00	4 95
Plymouth, R. A., *Nel*	....	....	5 25	5 55	6 00	4 95
Susque. Coal Co. at Amboy W.A.	5 05	5 15	5 25	5 55	6 00	4 95
Kingston at Hoboken	5 05	5 15	5 25	5 55	6 00	4 95
Lehigh Coals.						
Old Company at Port Johnston	5 55	....	5 50	5 60	6 00	5 10
Old Company's Room Run "	5 55	....	5 50	5 60	6 00	5 10
§Sugar Loaf, Hobok. & Amb."	5 55	....	5 50	5 60	6 00	5 10
Lehigh Coal Exchange "	5 55	....	5 50	5 60	6 00	5 10
Honey Brook Lehigh	5 35	....	5 50	5 60	6 00	5 10
Spring Mt. C. Co. at Hoboken	....	....	..	....	....	....
Beaver Meadow at South Amboy	5 55	....	5 50	5 60	6 00	5 10
†**Schuylkill Coals at Port Richmond.**						
Schuylkill white ash	4 55	4 65	4 75	5 05	5 50	4 45
Schuylkill red ash	....	....	5 05	5 15	5 55	4 45
Shamokin white and red ash	....	....	....	5 35	5 70	4 50
Lorberry	....	....	5 80	5 80	5 80	4 65
Lykens Valley	....	....	6 40	6 40	6 40	5 50

	Per ton.
Freight from Hoboken and Weehawken to New York	40c.
" " Elizabethport & Port Johnston to N. York.	45c.
" " South Amboy to New York	50c.

*Freight on Lackawanna coal from Rondout to New York, by boats or barges of the D. and H. Canal Co. 50c. per ton. The expense of towing vessels from New York harbor to Rondout and back will be borne by this Company.

† Freight from Port Richmond to New York (free of discharging) 85c. per ton.

‡ Prices to the Trade.

§ By Canal at New York, Jersey City and Brooklyn, 30c. additional alongside.

Schuylkill coal is delivered f.o.b. of boats in New York harbor at 50c. per ton additional to these rates.

Pittston coal is delivered to carts in New York or Brooklyn at 65 cents per ton in addition to the above rates.

Wholesale Prices of Bituminous Coal.

Domestic Gas Coals.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside in New York.
Westmoreland and Penn. at Greenwich, Philadelphia	$5 20	$6 50
" " at S. Amboy	6 00	6 50
Red Bank Cannel Pa. at Philadelphia	8 00	8 50
" " South Amboy	8 50	..
" Orrel	6 00	6 50
Youghiogheny, Waverly Co., at Balt	5 00	6 50
Despard, West Va.,	——	6 50
Murphy Run, West Va., at Baltimore	4 75	6 50
Fairmount, West Va., " "	4 75	6 50
Newburgh Orrel, Md. " "	4 75	6 50
Cannelton Cannel, W. Va., at Richmond.	9 50	11 00
" Splint, " "	5 00	6 50
Peytona Cannel, " "	9 50	11 50
Straitsville " at Sandusky, O	3 25	10 00

Foreign Gas Coals.

	Sterling.	Am. cur'cy,
Newcastle, at Newcastle-on-Tyne	10/6@12/9	6 50@ 7 00
Liverpool House Orrel, at Liverpool	26/	13 00
Ince Hall Cannel "	47/	18 00@20 00
" Gas Cannel "	30/	12 00
Scotch Gas Cannel, at Glasgow, nominal,	25/	7 50
	Gold.	
Block House, at Cow Bay, N. S	2 00	5 50
Caledonia, at Port Caledonia	1 75	5 25
Glace Bay, at Glace Bay	1 80	5 50
Lingan, at Lingan Bay	75	....
Sydney, International and Reserve mines, at Sydney	2 00	5 50
Pictou, Albion & Vale mines, at Pictou.	2 25	5 75

Steam and House Coals.

Broad Top, at the mine, $1 25; at Amboy	4 75@5 00	5 25@5 50
Cumberland, at Georgetown and Alexandria, Va	4 00@4 25	5 25@5 50
Cumberland, at Baltimore	4 15@4 50	5 75@6 00
Clearfield and Allegheny, "Derby," "Kittanning," "Sterling," "Sonman," and "Eureka," at the mines, $1 25; at Greenwich, Phil.	4 60	5 65

Retail Prices in New York.

Anthracite.

Per 2000 lb.	Grate and Egg.	Stove.	Chestnut.
Pittston coal, in yard	$6 20	$6 40	$5 60
*Lackawanna coal, delivered	6 75	7 00	6 25
Wilkes-Barre, "	7 00	7 25	6 75
Lehigh & Locust Mountain, del'd	7 00	7 50	6 50
Schuylkill Red Ash, del'd	7 00	7 50	

The Cost of delivering Pittston coal ranges from 40 cts. to $1 per ton, according to distance from the yard.

* Lackawanna grate is quoted 25c. per ton less than egg.

Williamsburgh, N. Y.

Lackawanna Coal at Yard.

Stove	$6 40
Egg	5 90
Chestnut	5 40

Bituminous.

Liverpool House Orrel, delivered, per ton of 2000 lb	$23 00
Liverpool House Cannel " " "	25 00
American " " " "	16 00
American Orrel " " "	11 00
Red Bank Cannel " " "	14 00
Cumberland " " "	7 00

Prices of Lackawanna, Plymouth and Shamokin Coal, for the Month of September, at various points.

PER TON of 2000 lb.

	DELIVERED AT						
	Elmira.	Watkins.	Ithaca.	* Syracuse.	† Oswego.	† Rochester.	‡ Buffalo.
	Afloat	Afloat	Afloat	Afloat	F.O.B	Afloat	Afloat
Grate	4 50	4 80	4 80	4 95	5 90	5 65	5 90
Egg	4 50	4 80	4 80	4 95	5 90	5 65	5 90
Stove	4 90	5 25	5 25	5 40	6 35	6 10	6 35
Nut	4 65	5 00	5 00	5 15	6 10	5 85	6 10

† Coal is delivered to retail consumers at these points for $1.25 per ton additional to these rates.

* At this point 70c. per ton additional is charged to retail consumers.

‡ At this point 50c. per ton additional is charged to retail consumers.

Baltimore, Md. Aug. 30, 1875.

Reported by our Special Correspondent.

ANTHRACITE.

Wholesale or Trade Prices per 2240 lb.

Wilkes-Barre "Lee" or "Diamond," Pittston and Plymouth. White ash.	In cars at depot.	By boats afloat.
Lump and steamboat	$4 80	$4 65
Broken	5 46	5 31
Egg	5 77	5 62
Stove	6 02	5 87
Nut	4 90	4 87
Shamokin, (red or white ash), and "Boston," freeburning white ash,		
Egg	5 80	5 62
Stove	6 00	5 87
Lykens Valley, red ash,		
All sizes	6 30	9 12

From wharf or yard, wholesale, 50@75c. additional.
By retail, all kinds and sizes, per 2240 lb. $7 00@8 00.

BITUMINOUS.

George's Creek and Cumberland f. o. b. at Locust Point	4 15	4 50
West Virginia f. o. b. at Locust Point		5 50
Youghiogheny Gas, f. o. b. at Locust Point		5 50
Swanton Coal, George's Creek		4 40

Boston. Sept. 1, 1875.

Reported by our Special Correspondent.

CARGO PRICES TO TRADE.

Lingan coal	$ 5 20	Westmoreland and Penn.	6 85
Caledonia	5 00	Waverly Co. Youghiogh'y.	6 80
Pictou	5 60	Cannelton Cannel	11 60
Block House	5 20	Cumberland	5 80@ 6 00
Red Bank Cannel	10 00	Anthracite	6 50@ 7 25
Glace Bay	5 00	" retail	7 50@ 8 00
Sydney	6 25		

The market is well supplied with English Cannel, and the sales have been in lots to dealers on private terms: and in retail lots at $24 per ton. In Nova Scotia coal nothing has been done and prices are nominal. Gas coals continue to arrive quite freely and have been delivered on contracts made some time ago. The market for Cumberland is quiet and nothing of any consequence has been done. The Anthracite trade is dull with large arrivals at tide water and a good supply in the hands of dealers. We quote retail sales at $7 75@8 25 per ton, and cargo prices are nominally $6 50@7 per ton.—*Shipping List.*

Buffalo, N. Y. Aug. 30, 1875.

Reported by our Special Correspondent.

Prices free on board vessels here are as follows:

ANTHRACITE.

	Afloat.	F. O. B. Vessel.	Retail. Deliv'd.
Grate	$5 85	$6 35	$7 00
Egg	5 85	6 35	7 00
Stove	6 30	6 80	7 45
Nut	6 05	6 55	7 20

	Lump.	Run of Mine.	Nut.	Slack.	Nut & Slack.
Connellsville Coke	$5 50	....	....	....	....
Brookfield Coal	....	....	....	....	....
Briar Hill	4 50	....	....	....	3 00
Youghiogheny	4 75	....	....	....	....
Monterey	3 75	3 50	3 25	2 50	....
Catfish	3 75	3 50	3 25	2 50	....
Stoneboro	....	....	3 25	2 50	....
Sterling Cannel	5 50	....	....	....	....
Buffalo Coal Co	3 50	3 25	....	2 30	....

Chicago, Ill. Aug. 30, 1875.

Specially reported by Messrs. RENO & LITTLE, Coal Merchants.

Retail prices per ton of 2000 lb. delivered to buyer.

No change in prices of coal.

Lehigh Lump	$10 00	Briar Hill and Erie	@ 7 00
Lehigh grate and egg	10 00	Walnut Hill, Pa	@ 6 00
Lehigh stove and chest	10 50	Midway, Pa	@ 6 00
Lackawanna, Wilkes-Barre and Pittston*		Cannel	@ 9 00
		Blossburg	8 00
Grate and egg	9 00	Indiana Block	5 50
Stove and chestnut	9 50	Hocking "Brooks"	6 00
		Wilmington and Illinois.	4 50

BITUMINOUS.

* 50 cents off these prices for car load lots to country dealers and manufacturers.

Cincinnati, O. Aug. 30, 1875.

Reported by our Special Correspondent.

No change in prices of coal.

Per ton of 2000 lb.	Bush.	Ton.
Youghiogheny, or Pittsburgh, afloat	7½c.	——
Pomeroy coal "	6c.	——
Cannel coal, according to quality	12½@16c.	——
Semi Cannel	7½c.	——
The following are the retail prices delivered:		
Youghiogheny	— c.	$3 25
Pomeroy	— c.	2 75
Cannel	— c.	5 50
Kanawha Semi Cannel	— c.	3 25
Anthracite	9	50@10
Foundry coke	—	——
Coke, hard and soft	10 c.	——

Cleveland, O. Aug. 31, 1875.

The market remains without change at our last week's quotations.

Chicago and Milwaukee lake freights have advanced materially, and vessels are scarce; freights to other points remain nominally unchanged.

WHOLESALE.

Per ton of 2000 lb. f. o. b. vessels.	For vessels,	On cars.
Youghiogheny Gas Coal	$4 40	$4 15
Cannell	4 50	4 15
Blossburgh	5 00	5 00
Briar Hill Block Coal	3 80	3 60
Hocking Valley	3 25	3 10
Straitsville Coal Co., lower vein	3 25	3 10
Mineral Ridge	3 10	3 25
Massillon	3 10	3 30
Tuscarawas Valley	2 85	2 70
Columbiana	2 80	2 60

RETAIL DELIVERED.

	Lump.	Nut.
Briar Hill	$5 00	$3 50
Massillon	4 50	4 00
Mineral Ridge	4 50	4 00
Columbiana	3 25	3 00
Stillwater	3 25	3 00
Tuscarawas Valley	3 25	3 00

ANTHRACITE DELIVERED.

	Grate.	Egg.	Stove.	Chestnut.
Lehigh	$9 00	$9 00	$9 50	$9 25
Wilkes-Barre	7 75	7 75	8 25	8 00
Lackawanna	7 75	7 75	8 25	8 00

—*Manufacturing and Trade Review.*

Detroit, Mich. Aug. 30, 1875.

Specially reported by Messrs. ROBINSON & KEYS, Dealers in all kinds of coal.

Per ton of 2000 lb.

Lehigh Lump, per ton	$10 50	Blossburg	8 50
Lehigh " prep. sizes.	10 00	Briar Hill	7 50
Wilkes-Barre, Grate and Egg	9 00	Willow Bank	7 00
Wilkes-Barre, Stove and Nut	9 50	Erie	7 50
		Massillon	7 00

Erie, Pa. Aug. 30, 1875.

Reported by our Special Correspondent.

Wholesale, per ton of 2000 lb. Bituminous f. o. b.

Briar Hill lump	$3 75	Beaver lump	$3 50
Midway	3 25	Cat Fish	3 00

Indianapolis, Ind. Aug. 30, 1875.

Specially reported by Messrs. COBB & BRANHAM.

Wholesale on board cars, and retail delivered to consumers.

Per ton of 2000 lb., bushel of 70 lb.

BITUMINOUS.

IndianCreek, per ton	$2 75	Peytona cannel, per ton	7 00
White River, "	2 75	Indiana Cannel	6 50
Brazil Block, "	2 05	Hocking Valley	4 25
Highland, grate, "	2 25	Youghiogheny	4 75
Block coal, nut, per car	18 00	Blossburg (smithing)	6 50
Highland " "	13 00	Piedmont "	6 50
Block Slack "	17 00	Gas coke, per bushel	10

ANTHRACITE (Lackawanna and Wilkes-Barre.)

Broken	$9 95	Nut	9 80
Egg	9 95	Stove	10 25

Owing to the Miner's strike there is no Lehigh coal in this market.

Retail, per bushel, delivered.

Sand Creek	15c.	Block Nut, steam	8
White River	14	" Slack, "	
Brazil Block	14	Peytona Cannel	6
Highland grate	14	Indiana "	24
Block Nut, domestic use	12	Youghiogheny	20
Highland Nut, "	12	Blossburg	26
" " steam	8	Piedmont	26

GAS COKE (measured.)

Crushed	15c.	Lump	12c.

ANTHRACITE,

Wilkes-Barre and Lackawanna (all sizes)	$10 per ton.
Lehigh, retail	$11 50 per ton.

Louisville, Ky. Aug. 30, 1875.

Specially reported by Messrs. BYRNE & SPEED.

WHOLESALE.

per bushel		per bushel	
Pittsburgh	8c	Pine Hill	9c.
Raymond City	9c.	Kentucky	9c.

RETAIL.

per bushel		per bushel	
Pittsburgh	14c.	Peytona Cannel	22c.
Raymond City	12c.	Buckeye "	20c.
P ne Hill	12c.	City-made Coke	10c.
Kentucky	11c.	Auth., per ton, $10 00 to 10 50	

Screened Pittsburgh per load	$3 00
Screened Raymond City	2 75
Pine Hill (Kentucky)	2 75
Cannel	$5 to 5 50

Milwaukee, Wis. Aug. 30, 1875.

Specially reported by Messrs. R. P. ELMORE & Co.

Retail price per ton of 2000 lb.

Lehigh Lump	$10 00	Scranton	$9 50
Lehigh Prepared	10 50	Briar Hill, select	8 00
Lackawanna	9 50	Blossburgh	8 00
Pittston	9 50	Pittsburgh	7 00

New Orleans, La. Aug. 28, 1875.

We have now a large stock on hand in consequence of fresh arrivals, and a little activity has been imparted to the market, owing to some forced sales at 32 cents, by parties who were compelled to realize on arrival. Now that those weak holders have worked off their stock the market is firm. We quote:

Pittsburgh coal, retail, per bbl	75c.
" wholesale	35c.
" steamboats, per box	——
" to manufacturers, per bbl	65c.
" shipments, per hhd	$7 00
Anthracite, wholesale, per ton	....
" retail, "	...
Virginia Cannel, per bbl	80c.
Scotch " "	....
Mt. Carbon, wholesale, per bbl	35c.
" " retail, "	65c.
St. Bernard, wholesale, per bbl	30c.
" retail, "	50c.

Pittsburgh, Pa. Aug. 31, 1875.

By our Special Correspondent.

I have no change to report in prices or state of trade, which is one of unusual dullness, with no prospect of an early improvement.

Per ton of 2000 lb. and Bushel of 76 lb.

Youghiogheny coal, ton,	$2 00	Pittsburgh retail deliv'd. per bushel	9@10c.
" coke, "	2 50		
Connellsville coal, "	2 50	Anth'cite on cars Lehigh	$7 75
" coke	$2 25@2 75	" " Wilkes-	
Pittsburgh coal	1 85	Barre	6 75

Twenty-five to fifty cents per ton additional for delivery.

COAL.—There is no improvement to note in the coal trade, and furthermore the indications are not very favorable. Navigation being suspended, there is no movement by river, and the shipments by rail are reported light. Lump coal is quoted at 5¾@6c. per bushel on cars at works, and nut coal at 4½@5c. Our latest advices from all the down river markets are not favorable to dealers; stocks, both afloat and in yard, are reported large, unusually so, and the consumption and prices down to a point that affords little or no margin for profit; it is quoted at 7½@8c. afloat at Cincinnatti, and Louisville about the same. It is not likely that there will be a decided improvement in this branch of business for some months to come.

COKE.—There is a fair trade, all that can be expected at this season of the year and under existing circumstances; the production is light, manufacturers, almost without an exception, are working on orders, determined not to accumulate, and consequently the stock in first hands is more reduced now than it has been for several years. In the event of a revival in the pig iron trade, and anything like a general starting up of the idle furnaces, an advance in the price of coke would be almost sure to follow. The most of the ovens are in operation, but from what we can learn, very few of them are working up to anything like their full capacity, and, as already stated, makers are determined not to pile up. The market may be quoted steady at $2 65@2 75 per ton delivered free on cars in Pittsburgh.—*American Manufacturer.*

Richmond, Va. Aug. 30, 1875.

Specially reported by S. H. HAWES, Dealer in Coal.

Per ton of 2240 lb., f.o.b.

Kanawha Cannel	$12 00	New River Bituminous,	$4 50
" semi-Cannel	4 75	Clover Hill Coal	4 25
Coalburgh Splint	4 90	James River Bitum	3 30
Lewiston "	4 90	" " Carbonite,	5 80
Kanawha Gas coal	4 50		

San Francisco.

From the *Commercial Herald*, Aug. 19, 1875.

Imports from January 1st to Aug. 16:

Anthracite tons	7,312	English, tons	27,637
Australian, tons	79,056	Vancouver Island, tons	37,772
Coos Bay, tons	23,112	Rocky Mountain, tons	42
Cumberland, tons	6,703	Seattle, tons	34,072
Mt. Diablo, tons (6 mos)	87,318	Bellingham Bay, tons	6,670

Last week we alluded to a novel shipment of Lehigh coal across the Continent. Since then, our Baltimore exchanges have come to hand and the shipment is reduced to 200 tons—freights $25 per ton in currency—making the cost of the coal delivered on this coast $31 in currency. This parcel of anthracite was no doubt ordered to make good a momentary deficiency by reason of the non-arrival of expected supplies by sea. The same description of coal is offered here now (prior to its arrival) upon more advantageous terms. There is, however, no scarcity of any other coal here but anthracite, and no felt want even for that now, and we hope ere long to do without even that little by reason of home products. Our market continues to be well supplied with Australian and other Pacific Coast mines. Sydney by the cargo has recently been sold as low as $8 50 for large cargoes, and this may now be quoted as the rate to arrive, although spot parcels are held at $9 or less. Imports for the week include 2,840 tons Wellington, per *Vasco de Gama*; 530 tons Seattle, per *Harrison*; 530 tons Coos Bay per *Empire*; 1,340 tons Seattle per *Aureola*; 1,025 tons Seattle per *Montana*. We quote Bellingham Bay at $8 50; Coos Bay, $10; California Mt. Diablo Steam, $6 25@8 25 for fine and coarse respectively. Cumberland, $16@18; Nanaimo, $9 50@10; Seattle, $9 25@10.

Freights.

Representing the latest actual charters up to Sept. 2, 1875.
Per ton of 2240 lb.

PORTS.	From Philadelphia.	From Baltimore and Georgetown.	From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken.
Augusta, Me	....	2 00	....
Albany	*85	1 70	....
Amesbury, Mass	....	....	....
Bangor, Me	†1 35	2 00	1 25
Bath, Me	1 60	1 65@1 80	1 30
Baltimore	....	....	....
Boston, Mass	§1 60	1 65@1 70	1 25
Bridgeport, Ct	*85	1 45@1 50	80
Bristol, R. I.	....	....	90
Cambridgeport, Mass	§1 60	....	1 25
Derby	....	1 60	....
Dighton	....	1 65	§1 25
East Cambridge	1 60&3c.	....	....
Fall River	1 35	1 45@1 50	90
Hackensack	....	....	....
Hallowell, Me	....	....	....
Hartford	1 70	2 00	1 25
Hoboken	†85	1 30	40
Hudson	1 00	1 60	....
Jersey City	....	1 30	40
Lynn, Mass	†1 60	....	†1 25
Middletown	....	....	1 10
Mystic	....	....	....
Newark	....	....	....
New Bedford	1 30	1 50	90
Newburyport	1 65	1 75	1 35
New Haven	*85	1 45@1 50	90
New London	1 20	1 45@1 50	85
Newport	1 35	1 45@1 50	90
New York	85†	‖1 40	40
Norfolk, Va	85	50	....
Norwalk	1 35‡	1 65	90
Norwich	....	1 65	90
Pawtucket	1 45‡	1 75	‡100
Philadelphia	....	80@1 00	....
Portland	1 25†	1 65@1 75	1 20
Portsmouth, N. H.	1 60@1 70	1 80	1 40
Providence	1 35	1 50	90
Petersburg, Va	....	90	....
Portsmouth, Va	....	....	....
Poughkeepsie, N. Y.	*85	1 50	....
Richmond, Va.	90	70	....
Rockport.	....	....	....
Saco	2 00	....	....
Sag Harbor	....	....	1 00
Salem, Mass	1 60	1 70	1 25
Salisbury Pt., Mass	....	....	1 50
Savannah, Ga	....	1 50	....
Stamford	*85	....	85
Stonington	....	....	....
Taunton	.. .	...	1 30
Trenton, N. J.	....	....	....
Troy	....	....	....
Warren, R. I.	....	....	90
Washington, D. C.	80	....	....
Wareham	....	1 65	....
Weymouth	....	1 80	....
Wilmington, Del	....	85	....
Wilmington, N. C.	....	1 50	....

* And discharging and towing.
† And discharging. ‡ And towing.
§ 3c. per bridge extra.
‖ The rate to this point by barge is $1 65.
§ To wharf.

Freight on Nova Scotia Coals.

Pictou, Nova Scotia, to	New York	$1 80
" " "	Portland, Me	2 00
" " "	Montreal, Canada	2 35
" " "	Quebec, "	1 80
" " "	Halifax, N. S.	1 25

Pilotage for vessels of from 80 to 150 tons. $6 inward and $4 outward. From 150 to 1000 tons, 10 to $17 inward and $6 to $12 outward. Vessels of 1000 tons and upwards, 2c. per ton inward and 1½c. per ton outward.

Towage 3c. per ton. Trimming 3 hatch vessels, 6c per ton. Two hatch vessels 7c. per ton.

Delaware and Raritan Canal.

Tolls and Steam Towage.
Per 2240 lb. Cargoes to exceed 110 tons.

From Fairmount to	New York, towing limits within 53d st.	74c.		
" Greenwich	"	Bituminous	64c.	
" "	"	Anthracite	69c.	
" Lambertville	"	Anthracite	62c.	
" Port Richmond	"		68c.	
" "	"	Semi-bituminous coal,	63c.	
" Philadelphia	"	Cumberland "	58c.	
" Trenton	"	Anthracite "	37c.	

CANAL TOLLS, exclusive of towage, Bordentown to New Brunswick, when towed by the Company's Steam Tugs:
For Anthracite Coal....35c.
Bituminous and Semi-bituminous Coal...35c.

Towing.

From foot of 23d Street, East River, and *return*, *per ton*.

	cts.		cts.
Bridgeport, Conn	33⅓	New Haven and Norwalk, Conn	33⅓
Hartford and Stonington, Conn	75	New London, Conn	60
Norwich, Conn	68	*Derby, "	33⅓
Stamford, Conn., per boat	$75	Harlem, N. Y., per boat.	$18
Whitestone, L. I.	$30	Glen Cove, L. I.	50

	cts.
Manhattanville, via Hudson River, per ton	8
Harverstraw and Peekskill, via Hudson River	16
West Point and Cold Spring " "	17
Rondout " "	23
Yonkers, boats of 100 tons capacity " " per boat.	$15
Sing Sing and Peekskill " " " "	20

* $30 per boat extra is charged for towage to this point.
Boats having less than 200 tons will be charged the same to Eastern points as if carrying that quantity.

OFFICE OF THE PA. & N. Y. R. R. Co.,
Bethlehem, September 1st, 1875.

On and after this date, rate on coal to Buffalo, Rochester, and points west of Salamanca on Atlantic & Great Western, or Erie Railways; Watkins, for shipment, on Ithaca & Athens R. R.; Auburn, for New York Central R. R.; Weedsport, for Erie Canal; Sterling, for Lake Ontario Shore R. R.; and Fair Haven, on Southern Central R. R.; will be advanced on this road 1 cent per ton, making the rate between Coxton and Waverly, on through coal, via Erie Railway, including transhipment at the latter place, $1 51 per ton.

ROBERT H. SAYRE,
President.

THE BRITISH COAL AND IRON TRADES

LONDON, Aug. 21, 1875.

THE IRON TRADE.

There is no improvement noticeable; where a better business or better feeling is observable in one district, it is counterbalanced by an equal depression in another. The demand for shipments in the North of England continues very fair; the demand for manufactured iron in South Staffordshire is more quiet; there is but little inquiry for Bessemer and other irons in the Barrow-in-Furness district, while a better feeling exists in the iron trade of South Wales, although the number of new orders received is not large; business is in an unsettled condition awaiting the discussion and settlement of the labor question.

The following are the leading quotations of iron:

——	Tees, f.o.b.	Barrow, f.o.b.	Liverpool, on trucks.
No. 1 Pig	55/	*80/	70/6
No. 2 "	52/6	*77/6	....
No. 3 "	49/	*75/	68/
No. 4 Forge	47/	75/	65/
Common Bars	152/6		....
Rails	140/@147/6		142/6@147/6

* Bessemer Pig.

Common bars in South Staffordshire, £7 10/, and marked bars £10 12/6 extra for Lord Dudley's. Rails in Wales £6 15/, and bars £7 10/@8.

THE COAL TRADE.

The condition of the trade remains very much as reported for several weeks past, with prices inclined to fall on most descriptions. The shipments from Hull, Grimsby and Goole, last week, were not nearly so large as for the week previous, although several thousand tons in excess of the shipments during the corresponding week of 1874. A very large business continues to be done from South Wales, although it is somewhat restricted for want of shipping. Prices continue very low and give but small profits in any case while in some cases loses are incurred. Tyne coals are quoted f. o. b. as follows: 12/@15/ 9d. for steam; 9/@12/ for gas; 9/@12/ for coking; 8/@13/ for smith's; 9/@12/ for hard steam nuts; and 15/@20 for coke. Common steam coal at Liverpool 10/; at Rhymney 10/ 9d. Best double screened steam coal f. o. b. Cardiff 12/ 9d.; colliery screened 11/ 3d.@12/; best patent fuel 14/ 6d.

THE LABOR MARKET.

A treaty of peace was entered into between the South Wales masters and workmen, last May, to begin June 1st, and continue for three months, after which time wages were to be paid on a sliding scale. Both the masters and the colliers have appointed committees to decide upon a basis, but it is found to be a very difficult task. Considerable anxiety exists awaiting their decision.

The Warwickshire miners, numbering about 1,600, have now been on a strike 15 weeks, and there is no prospect of an early resumption of work. The masters ask the men to submit to the reduction now asked and refer all future disputes to arbitrators, while the men ask to have the present dispute arbitrated. Both parties appear quite firm.

MR. MCDONALD, M. P.,

Addressed a large body of miners at Ripley, on Tuesday. He advised the miners not to be arbitrary in enforcing their demands at this time, but rather to submit to a reduction of wages for a time than to have their Unions crushed. He advised them to submit all disputes to arbitration.

The Askem-in-Furness Ironworks Company have given their men notice of a reduction of 12 per cent., to go into effect on the 30th inst.

MEETING OF THE IRON AND STEEL INSTITUTE.

The next meeting of the Iron and Steel Institute, which commences on the 6th of September, at Manchester, promises to be more largely attended than any previous meeting. The voting list for this meeting comprises about 70 gentlemen, who have been passed by the council. The half-yearly *Journal* of the Institute is expected to be issued in a few days.

SCOTLAND.

THE IRON TRADE.

The warrant market has shown but little animation during the past week. Prices receded until they reached 61/9d. on Thursday, although they regained somewhat yesterday, and closed at 62/6@62/9d. The number of furnaces in blast on the 13th instant was 114, as compared with 109 at the corresponding date in 1874. Makers finding that they could get as good, or better, figures for their iron by putting it in store, than otherwise, have disposed of considerable, and stocks in CONNAL & Co.'s stores increased over 4,000 tons during the week. The stock in their stores, yesterday, was 46,302 tons, as compared with 21,497 tons at the corresponding date of 1874. The shipments continue fair. For the week ending August 14th, they were 11,375 tons as compared with 9,488 tons for the corresponding week of 1874. The total shipments since December 25, 1874, show an increase of 84,185 tons, as compared with the corresponding period of 1873-4. The imports of Middlesborough pig into Grangemouth show a gain of 1,065 tons for last week, over the corresponding week of 1874, and 16,485 tons since the first of the year over the corresponding period of last year. Freights to New York are 5/; to Boston, 12/6d.@14/; and to Baltimore and Philadelphia, 12/@14/.

The closing prices yesterday of the leading makers' brands, were as follows:—Gartsherrie, 69/; Coltness, 72/; Summerlee, 66/; Langloan, 70/; Glengarnock, 67/6d.; and Eglinton, 62/. The above prices show advances on some brands, and declines on others.

THE COAL TRADE.

No change has taken place in the coal trade of Scotland. The shipping trade is not quite so good, but there is a better inquiry for household sorts. The shipments for the week ending August 14, were 46,577 tons, as compared with 46,538 tons for the corresponding period of 1874. The following are the quotations f.o.b. at the Glasgow Harbor cranes: Wishaw Main coal, 7/ 3d.@8/ per ton; house coal, 8/@10/ 6.; splint coal, 8/@8/ 9d.; steam coal, 9/@10/ 6d.; and smithy coal 14/ 6d. A few days ago, Mr. MCDONALD, M.P., addressed a large meeting of miners at Larkhill, and urged upon them the desirability of re-establishing their unions. He gave as his opinion that the state of the market would justify the miners in demanding an extra shilling per day in wages, and said that if they were united together they could accomplish this by the beginning of October.

IRON MARKET REVIEW.

New York.

FRIDAY EVENING, Sept. 3, 1875.

American Pig.—There is no improvements noticeable in the iron trade. The prospects for Fall trade are not in the least encouraging. Sales in a small way continue to be made, but we are reported none worthy of notice. Although prices are very low, it is encouraging to learn that some of the companies, owing to recent reductions in transportation rates and in the cost of coal, are enabled to make a profit. Since our last the failure of the Peekskill Iron Co. has been announced. A statement of their affairs has not been made public, but it is thought that it will not be a very satisfactory exhibit. We quote No. 1 foundry at $26; No. 2, $23@$24, and forge at $20@22.

Scotch Pig.—We are reported sales of about 100 tons of Eglinton, at $28; 50 tons of Carnbroe at $29; and 50 tons of Coltness at $32. Sales continue to be made in a small way not aggregating much. The Glasgow market closed on Wednesday, according to cable report, at the following quotations: Gartsherrie, 72/; Coltness, 75; Langloan, 72/; Summerlee, 66/; Glengarnock, 70/; Carnbroe, 65/, and Eglinton 64/. These figures show an advance over last week, and have given more firmness to dealers here. Our mail advices indicate that the Scotch market is being bolstered up by speculators, and that the business reported is not a legitimate one. This cannot last forever. It will be found that the markets of the world are drugged with Scotch iron, and as much has been shipped on consigment, the account sales will make

so bad an exhibit as to deter further shipments, and then, where will a market be found for the products of the furnaces, and stocks already accumulated? There will be none, and as a consequence a reaction looks inevitable. We quote Carnbroe at $29; Eglinton $29@$30; and Coltness $32 50@$33.

Rails.—We are reported no further business. Inquiries continue in the market, but there do not appear to be prospects of much business being done this Fall. We quote iron rails at mill at $47@50 although we are informed by a maker that cash orders could be placed at $46. Steel rails continue without business, at $75 at the mills

Old Rails.—There is but little business doing in this article. The nominal quotation is $26, although we have heard of lower ones having been made.

Scrap.—We are reported a sale of 200 tons of No. 1 wrought, on private terms, and quote at $32 50@35.

Statistics of the Production of Iron and Steel, 1874.—The American Iron and Steel Association has just published complete statistics of the production of all forms of iron and steel in the United States, in 1872 1873, and 1874, of which the following, which appears in the city daily papers, is a partial summary:

	1872.	1873.	1874.
Products, net tons, pig iron	2,854,550	2,868,278	2,689,413
All rolled iron, including nails	1,941,992	1,966,445	1,839,560
All rolled iron, including nails and excluding rails	941,992	1,076,368	1,110,147
Rails of all kinds	1,000,000	890,077	729,413
Bessemer steel rails	94,070	129,015	144,944
Iron and all other rails	905,930	761,062	584,469
Steel rails	15,000	9,430	6,739
Kegs of cut nails and spikes	4,065,322	4,024,704	4,912,180
Merchantable Bessemer steel other than rails	16,430	27,985	31,635
Total of merchantable Bessemer steel	110,500	157,000	176,579
Crucible cast-steel	27,260	32,786	54,128
Open-hearth steel	3,000	3,500	7,000
All other steel	7,740	13.714	6,353
Blooms from ore and pig-iron	58,000	62,564	61,670

From the above summary it appears this country produced in 1874 much more iron and steel from pig iron to the finished product than any person familiar with the trade has ever imagined. Of pig iron we produced only 178,865 net tons less than in 1873. Of all rolled iron, rails included, we produced only 126,885 net tons less than in 1873; and of rolled iron, excluding rails, we actually produced 33,779 net tons more than in 1873.

Baltimore. Sept 1, 1875.

Specially reported by Messrs. R. C. HOFFMAN & Co.

The iron market continues dull, with no indications of any early improvement. No change in prices

We quote:

Baltimore Charcoal	$30@35	Anthracite No. 2	$24@25
Virginia Charcoal	29@34	" No. 3	22@24
Anthracite No. 1	26@27	Mottled and White	20@21

Boston. Sept. 2, 1875

Messrs. E. P. CUTLER & Co., under date of Sept. 2, 1875 say:

We have nothing of interest to report in the above trade, for the week past; there has, however, been more inquiry, and some few hundred tons of various brands of iron sold for consumption. Scrap is inquired for and costs are light, the present quotations are the ruling prices from store for pigs.

IRON—Since the movements reported in our last, there has been nothing done in pig worthy of special notice. The local demand for American continues light, with small sales from store at $27@31 per ton. Scotch pig is quoted nominally $33@35 per ton, in the absence of sales. In refined bar there is some irregularity in prices, owing to outside lots being placed on the market, but dealers' prices remain at $58 per ton, with no improvement in the demand. Common bar is quoted by dealers at $53@54 per ton. Rails are moving slowly at unchanged prices. We quote American at $48@52 per ton. In sheet iron, trade is light and prices nominally unchanged.

Imports of pig iron from Jan. 1 to Aug 28.

	1874.	1875.
From Great Britain, tons	2,475	1,400
Coastwise	7,817	8,897

LEAD—There are no movements in pig to report, except small sales to consumers at previous prices. We quote domestic at 6c., gold, with a tendency in favor of buyers. The demand for sheet and pipe is light, but prices are steady at 9¼c. per lb. Other lead manufactures are selling slowly at unchanged prices.

Imports from Jan. 1 to August 28.

	1874.	1875.
Pigs	69,301	22 054

COPPER—No change has been made in prices of manufactured copper, but there is a firmer feeling, in sympathy with the upward tendency in ingot. We quote copper sheathing at 30c.; bolts and braziers at 31c.; and yellow metal sheathing at 22c. per lb.

TIN—Pig is firm at 18¾@19c., gold, for Straits. No sales of consequence here.

TIN PLATES—There is a moderate demand for plates at unchanged prices. We quote currency rates as follows:—Charcoal IC at $10@10 25; coke at $7 75@8 50; and terne, including all kinds, at $7 75@10 75 per box.—*Shipping List.*

Cleveland, Ohio, Aug. 30, 1875.

We are unable to chronicle any new features in the market.

Louisville. Aug. 30, 1875.

Specially reported by Messrs GEORGE H. HULL & Co.

Foundry irons are again dull, with little demand The mills are generally running and there is some demand for their grade.

Pittsburgh. Aug. 31, 1875.

Specially reported by A. H. CHILDS, Esq., Commission Merchant for the sale of pig iron, blooms, ore, etc.

The market is quiet and prices unchanged. There is a fair demand in a small way for immediate needs, but some concession would be necessary to effect large sales.

QUOTATIONS.

No 1. foundry	$27 00@28 00—4 mos
" 2. "	25 00@26 00—4 mos
Gray Forge	24 00@25 00—4 mos
White and mottled	22 00@23 00—4 mos
Hot blast charcoal	28 00@30 00—4 mos
Cold blast charcoal	35 00@40 00—4 mos

PIG IRON.—The general position of the pig iron market remains substantially as noted in our last report, business continues quiet, as it usually is at this particular time, but an early improvement in the demand is expected, and while the outlook is not as promising as it was a week ago, in consequence of the recent failures which have weakened confidence again, we think there is not much doubt but that there will be an average Fall and Winter trade. The mills generally are running, some of them double turn, and as the great majority of them have very light stocks of pig, unless they shut down, which is not likely, an increased demand is only a question of a little time; and as stocks, both in the hands of commission merchants and producers, are very much reduced, with any increase in the demand an advance in prices is not improbable. As yet the mills have been able to obtain about all they wanted at $24, 4 mos., but they continue to buy sparingly, only enough to supply immediate wants; whether they will continue this policy or contract for a two or three months' supply, is a question which cannot now be answered definitely, but unless there is an improvement in the products, particularly as regards prices we incline to the belief that the hand-to-mouth policy will be pretty closely adhered to. The feeling still prevails, however, that pig iron is not likely to go any lower, that an advance is more probable than a decline, yet the mills, for reasons already stated, are loth to take hold of it, notwithstanding many of them are impressed with the belief that it is good property, a safe investment at current rates; indeed, the fact of stocks being so much reduced, both in first and second hands, in connection with a very limited production, renders it almost certain that pig iron has reached bard pay for the time being at least. There is little doing in foundry grades, and prices are nominally unchanged.

MANUFACTURED IRON.—The most important matter we have to note is a convention of the iron manufacturers, in this city, last Thursday, which was largely attended, other points in the West as well as Pittsburgh being represented. The main object of the meeting, as we understand it, was to get an interchange of feeling, present as well as prospective, and if possible to agree upon a scale of prices that will afford a living margin for profits; also to check the ruinous cutting of rates that has been carried on all this season, and for which traveling agents to a very large degree are held responsible. It was agreed to not accept orders under $2 40 for merchant bars, with two per cent. off for cash, sixty days; as noted in our last review, it is proposed to get up an entire new card, in which the classification will be arranged differently, and if we are not mistaken, a committee for this work has been appointed, and will probably report at the next meeting of the Association, which takes place on Thursday week. Trade is moderately active, the mills are pretty much all in operation and it is hoped that rates will be sustained.

PIG METAL SALES REPORTED FOR THE WEEK ENDING SEPT. 1, 1875.

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORE.

30 tons No. 1 foundry	$26 50—4 mos.
25 tons No. 2 foundry	26 50—4 mos.
20 tons No. 2 foundry	25 00—4 mos.
50 tons No. 2 forge extra	25 00—5 mos.
1250 tons No. 2 forge	24 00—4 mos
700 tons No. 2 forge, C. S.	24 00—4 mos.
500 tons No. 2 forge	24 00—5 mos.
100 tons No. 2 forge, close neutral	23 00—4 mos.
60 tons white and mottled	22 50—4 mos.

CHARCOAL.

35 tons No. 1 foundry, H. R.	$29@33—4 mos.
200 tons No. 1 foundry, H. R.	30 00—4 mos.
45 tons No. 2 foundry, H. R.	27@28—4 mos.
60 tons mill, H R	25 50—time

MUCK BAR.

120 tons	40 00—4 mos.

American Manufacturer.

Richmond, Va. Aug. 30, 1875.

Reported by ASA SNYDER, Esq.

Virginia Cold Blast Charcoal Pig Iron					$30	to $35
"	Warm	"	"	"	28	to 32
"	"	"	Coke	"	1 X 26	to 27
"	"	"	"	"	2 X 25	to 26
"	"	"	"	"	3 24	to 25
"	Anthracite		1 X		27	to 29
"	"		2 X		26	to 27

San Francisco, Cal.

From the *Commercial Herald*, Aug. 19, 1875.

Last week we noticed small sales of Oregon pig iron at $42 50. This is the very top of the market for best brands of Scotch iron. Scotch and English iron to arrive is offered at $35 or even less; yet for spot parcels $37 50@40 may be considered as the market range, with a liberal stock on hand. The consumption is, however, large, American iron entering more largely into use than ever before. The general market for manufactured iron, steel, etc., is very sluggish, outside of jobbers few sales of importance making to affect wholesale prices.

St. Louis. Aug. 30, 1875.

Our market is still dull, with tendency towards low prices. Most of our furnaces are out of blast in this section, and all of those holding large stocks, have manifested their desire for better prices by withdrawing their iron from the market. We quote as follows on 4 months for car lots:

Specially reported by Messrs. SPOONER & COLLINS, Commission Agents for all kinds of Iron.

BITUMINOUS.

Missouri, No. 1	$27@28	Massillon A No. 1	$35@36
" " 2	$25@26	" B " 1	$33@34
" " 1 Mill	$24@25	" " 2	$32@33

CHARCOAL—HOT BLAST.

Missouri, No. 1	$27@28	Tennessee, No. 1	$26@27
" " 2	$25@26	" " 2	$24@25
" Mill	$24@25	" Mill	$23@24
Hanging Rock, No. 1	$28@29	Georgia, No. 1	$28@—
" " " 2	$26@27	" " 2	$26@—
" " " 3	$25@26	" Mill	$24@—

CHARCOAL—COLD BLAST.

Missouri Car Wheel	$33@35	Tennessee " "	$33@35
Alabama " "	$33@35	Hanging Rock "	$50@53

MISSOURI BLOOMS AND BILLETS.

Charcoal Blooms	$75@85	Hammered Billets	$90@100
Scrap "	$70@75		

METALS.

NEW YORK, Friday Evening, Sept. 3, 1875.

A very good jobbing business is doing in metals generally, although some articles show neglect. Prices however, show no improvement, but a fair feeling exists among dealers. Cable information from London, to-day, shows but little change in that market as compared with a week ago.

ERNEST W. G. MURRANT, Esq., of London, under date of August 20, says: "The past week has been a quiet one, but a small cloud of complication has arisen in Eastern Europe which may be the forerunner of a serious storm. Although efforts have been made to bring about a greater activity in the metal market, they have not been attended with much success. It is, however, a subject of congratulation that at the moment there are only rumors of further failures to report."

Gold Coin.—During the week past gold has ranged from 113⅞@114⅛ and closed at 114⅛.

Bullion.—Fine silver bar is quoted at $1 23@$1 24, gold, per ounce, and fine gold bar at par ($20 67, gold, per ounce,) to ¼ per cent. premium.

Copper.—The sales during the week have not been so large as for several weeks back, amounting perhaps to not more than 250,000 lb. at 23⅛c.@23½c. Brass manufacturers are holding off as much as possible, and are only buying for immediate wants, anticipating that prices will recede. The negotiations by a combination of manufacturers and dealers for 4,000,000 lb. of Lake copper, of which we made mention in our last, were consummated at 23½c. The deliveries will be made during September, October, and November. There is much difference of opinion relative to the future of this article, and its true position does not appear to be generally comprehended, nor will it likely be until further developments come to the surface. We quote to-day at 23⅜c. @23½c. The London market remains as last quoted, viz., £82 10/@£83, and was reported by cable, to-day, as easy.

Mr. MURRANT says: "*Chili*—On Monday the Charters, from the West Coast, for first half of the present month were cabled as 1200 tons. Price of bars on the coast 18.55 dols., equal to about £81, laid down in Liverpool, without commission on either side, so that a good profit is now being made on these importations. It was believed that the charters would have amounted to about 1300 tons and bars were a little firmer in anticipation, but no great anxiety to purchase has been shown since the arrival of the telegram. If these charters represent a genuine scarcity of metal on the coast, bars should be about £86, with forward prompt. They are *actually* selling at £81 10/ 3 months. The prices now demanded for bars, therefore, only represent holder's ideas, they being willing to take the risk of increased supplies and lower prices, instead of now selling at buyers' limits. The reported business of the week has been 500 tons of g. o. bs. and picked marks at £81 10/ to £83 for cash and forward delivery."

Tin.—A fair jobbing demand continues. Straits and English tin are firmly quoted at 19c.@19½c. gold, and Banca nominally at 23c. To-day's cable quotations from London were—Straits, £82 10/, and L. & F. £89. At Singapore the quotation is $22¾ per picul.

MR. MURRANT says: "In Straits, speculators for a rise are endeavoring to inspire confidence. Their operations have, however, so far, not induced consumers and others to add to their already heavy stocks. The tin famine which was to make its appearance about this time has not yet become visible, and the warning addressed to possible operators in April last, may very possibly hold good now. The imports for the month, both for London and Holland, are expected to be heavy. The sales of the week have been as follows:—170 tons of Straits and 250 tons Australian, at 74/ 6d to 80/ for cash and arrival."

Tin Plates.—A very fair jobbing demand continues, and the aggregate of large lots moved during the past

two weeks is considerable. We quote I. C. charcoal at $7 75@$8; charcoal ternes, $7.12½@$7.25; coke tins, $6.62½@$6.75; and coke ternes, $6.12½@$6.25 gold.

MESSRS. SANDERS BROTHERS, of London and Liverpool under date of August 20, say: "No revival in the demand from the United States having taken place, our market, as predicted in our last, has fallen into a very depressed state. Shipments to the States have been larger than last year, but we are given to understand that consumption has not increased in proportion, so that we can only conclude the stocks are heavier now than they were twelve months back. This, added to the fact that stocks in Liverpool are also heavy, being estimated at between 230,000 and 250,000 boxes, does not argue very well for the future of the trade. As mentioned in our last the works have realized the fact that production is considerably in excess of demand, and to meet this they have been working two-thirds time; the make, however, has not been diminished to any extent thereby, as the workmen, being paid by the piece instead of by time, do now nearly as much in four days as they previously did in six. I C coke ordinary brands are quoted at 21/@22; best brands, 23/@24/ 6d.; I C charcoal, ordinary brands, 25/@26 6d. best brands, 26/ 6d., and upwards."

Lead.—This article is quiet at 5·87½c.@5·90c. gold for domestic. We are reported sales during the week, mostly in a small way, of about 200 tons. Foreign is also quiet at 6⅞c. gold.

Spelter and Zinc.—There is but little doing in domestic spelter and nothing in foreign. The former is quoted at 7½c @7¾c. currency, and foreign at 7½c.@7¾c. gold. Sheet zinc is moving in a quiet way at 8½c.@8¾c. gold.

Antimony is in light stock and in a moderate way is selling at 13½c.@13¾c. gold.

Quicksilver.—The quotations are as follows: San Francisco 67½c.@70c., and 75c. per lb. here. Our latest mail advices from London quoted at £9 5/ per flask of 75 lb. or a decline of 10/@15/ since our last.

The San Francisco *Commercial Herald* of Aug. 19, says: "The export demand during the current month has been sufficient to absorb all that was offered at 65@67½c. for shipment. Jobbing price, 70c. The London quotation is given by cable at £9 10/ per flask. The exports by sea during the past week embrace 1,341 flasks valued at $69,992."

FINANCIAL.

New York Stocks.

FRIDAY, September 3, 1875.

The New York Stock market has hardly recovered from the shock given to it by the California suspensions; our quotations (with the exception of an unchanged condition in the Delaware & Hudson Canal Company's stock) exhibit a material decline. The failure of the negotiations which were pending between the Western Union Telegraph Co, and the Atlantic and Pacific Telegraph Co., giving control to the former Company, largely contributes towards this depression of the market; the stock of the Western Union Telegraph has 4 per cent. declined within the week, the influence of which has affected the whole market.

Mariposa has sold pretty freely during the week, closing at a slight decline. The tunnel was in 1,066 feet, August 22; the ground had changed to trap rock, and the water was increasing. Estimates for sinking a deep shaft on the Princeton mine are being made. Underground surveys fix the location of the vein at 1,125 feet from the tunnel's mouth. It is proposed to employ two hundred Chinamen to dig the canal from Broadhead Dam on the Merced River to the Ophir Mills. Seven Chinese companies are taking out gold from the placer mines on the northern boundary of the Mariposa estate.

One hundred shares Newark Coal Co. of Ohio (hypothecated) $100 each, sold at auction to-day at $14 per share.

The city of Fitchburg, Mass., water loan $100.000 at 6 per cent., thirty years, has been awarded to the New England Mutual Life Insurance Company of Boston, at 102½.

We note some sales of the National Screw Company's stock at Hartford, Conn., recently, at $120 per share.

The Northampton Iron Company at Bingen, Pa. have resolved to issue $100,000 additional preferred stock. They lost heavily in the failure of the Glen Iron Works at Allentown.

Coupons and interest on the following bonds are due and payable in New York during the present month. On the bonds of the Cameron Coal Company, the New Boston Coal Mining Company, the American Coal Company (scrip), the Kemble Coal and Iron Company, the Consolidated Coal Company (the Cumberland and Penn. R. R. bonds), the Union Iron Co of Buffalo, N. Y., the Himrod Furnace Co. of Youngstown, Ohio, and on the 2d mortgage bonds of the Delaware, Lackawanna & Western R. R., and the 1st mortgage bonds of the Lackawanna & Bloomsburg R. R.

Transactions in bonds have been limited; quotations, however, are generally firm.

Quotations and Sales of Stocks and Bonds,

For the week ending Sept. 3, 1875.

STOCKS.

	Highest	Lowest	Closing	Shares sold.
Pennsylvania Coal Co	—	—	270	—
Consolidation Coal Co	—	—	47	100
Spring Mt. Coal Co	—	—	63	—
American Coal Co	—	—	50	—
Maryland Coal Co	—	—	*19	—
Cumberland Coal and Iron Co	—	—	116	—
Del., Lack., and West. RR. Co	121	119¾	120	1145
Morris and Essex RR	—	—	102¼	—
New Jersey Central RR. Co	111¼	110	110	535
Delaware and Hudson Canal Co	120⅛	119½	120	123
Quicksilver Mining Co. pref'd	—	—	20	100
" " " Common	14¾	14¼	14¼	600
Mariposa Land & Min. Co. various	11	10	10	1800
St. Louis & Iron Mountain RR	—	—	18	140
Lehigh & Wilkes-Barre Coal Co	—	—	—	—
Total Shares sold				4543
Sales for the week previous				4795
Decrease				252

* Asked.

BONDS.

	Sales.	Price
Ches. & O. R. R. 6s, ex. cou	—	— @ 30
" " " coupon on	—	— @ 39
Central RR. of N. J. 1st Mtg. N.	16,000	110¾@111
" " " 1st Cons	23,000	106⅞@107
" " " Cons. Convt.	4,000	— @110⅜
Am. Dock Imp. Bonds	8,000	— @100
Del. and H. C., 1st Mtg. Reg. 1894,	4,000	— @108¾
Del. and Hudson Canal, 7s, '77	2,000	— @103
Del., Lack. & W. R. R., 7s, conv.	—	— @119
" " " " 2d Mtg.	—	— @111½
Morris and Essex, 1st C. gold	16,000	104¼@104¾
" " const. "	—	— @—
" " 1st m	—	— @114½
St. Louis & Iron Mount'n 1st Mtg.	22,000	90 @ 91½
St. Louis & Iron M'tn, 2d Mtg.	—	— @ 51
Total Sales	$95,000	

Closing quotations in the absence of sales, represent the latest prices bid.

Philadelphia Stocks.

PHILADELPHIA, Sept. 3, 1875.

But slight alterations are noticeable in quotations of Philadelphia Stocks, as compared with prices in our issue of Aug. 28th. The market was generally steady up to the announcement of the California failures, when it became very unsettled and continued excite dduring the two days of uncertainty with regard to the extent of the failures, and their effect on the New York and other markets. The market closed steady yesterday with prices inclined upward; sales for the week showing an excess of some 22,000 shares over those reported in our last.

Coupons and interest on the bonds of the following Companies are due and payable in Philadelphia, during the month of September:

On the 7 per cent bonds of the Lehigh Valley R.R. Co., on the 7 per cent. debenture bonds of the Reading Coal and Iron Co., on the 7 per cent. common bonds of the same, on the Convt. gold, 6 per cent. loan of the Lehigh Navigation Co.

The Locust Mountain Coal Co., has its semi-annual dividend period during the month. Coupons of the Lehigh and Wilkes-Barre Coal Co. are also payable during the month. Interest is also due on the bonds of the Barclay Coal R.R., also on the 2d m't'ge reg. bonds of the L. V. R.R., on the Schuylkill Navigation 1st m't'ge bonds. Interest is also due on bonds of the Penn. R.R., and the N. P. R.R., on the gold coupons of the N. J. R.R. and Canal Co. (The interest on the sterling loan of this Co. is payable in London.)

Bonds closed firm, and in many instances at an advance.

Quotations and Sales of Stocks and Bonds,

For the week ending Sept. 2, 1875.

STOCKS.

	Highest	Lowest	Closing	Shr's
Huntingdon and B. T. RR.	—	—	7	—
" " " Pref'd.	—	—	13	—
Lehigh Valley RR. Co	62¾	62⅜	62⅜	436
Little Schuylkill RR	—	—	50	58
Northern Central RR.	—	—	29¼	—
North Pennsylvania RR.	—	—	53	200
Pennsylvania RR.	50⅝	50⅜	50	50335
Reading RR.	56¾	56⅜	56⅝	3093
Delaware Division Canal	—	—	51	—
Lehigh Coal and Nav. Canal.	50¼	50	*50	10515
Morris Canal	—	—	50	—
" Preferred	—	—	126	—
Pennsylvania Canal	—	—	—	—
Schuylkill Navigation Canal	—	—	7½	—
" " Preferred	—	—	15	300
Buck Mountain Coal Co	—	—	—	—
Fulton Coal Co	—	—	—	—
Locust Mountain Coal Co	—	—	—	—
Westmoreland Coal Co	—	—	85	—
Cambria Iron Co	—	—	—	—
Crane Iron Co	—	—	—	—
Emaus Iron Co	—	—	—	—
Pennsylvania Salt Manufact. Co	—	—	74	25
Total shares sold				64,962
Sales for the week previous				43,044
Increase				21,918

* Ex. dividend.

BONDS.

	Sales.	Price
H and B. T. RR. 1st mortgage, 7s	2,500	— @106
" " " 2d "	—	— @102
" " " 3d " cons	—	— @ 55
Lehigh Valley RR. 6s, '93	—	— @103¼
" " " 7s, 1910	—	— @108
" " " con. mtge. 6s reg	3,000	— @ 99⅝
North Penna. RR. 2d mtge. 7s,	1,000	— @106
" " " gen. mtge. 7s,	13,000	103½@103⅝
Pennsylvania RR., gen. cou. 6s, '85	6,000	— @101¼
" gen. " reg. 1910	3,000	— @103⅜
" " gen. " 6s	—	— @101
Phil. & Reading RR. 6s,	—	— @101½
" " deb. bonds	—	— @ 80¼
" " " G. M. 7s, cou. 1911,	6,000	107 @107¼
" " " " reg. 1911,	—	— @106¾
" " " 6s g. 1911	—	— @107
" " new convertible 7s '93	1,300	— @109
Phil. & Reading C. & I. Co. 7s deb. '92	—	— @ 80
" " " M. 7s, Helf. tract.	—	— @ 90¾
Lehigh Coal & Nav. Canal, 6s '84	9,200	101¼@101¾
" " " RR, '97	600	— @101¼
" " " '77	—	— @*96½
" " " conv. '82	—	— @102
" " " g. '94	—	— @106¼
" " " gold, '97	1,000	— @103¼
Morris Canal, 1st mtge. 6s, '76	—	— @100
" " 2d " '76	—	— @100
" " boat, '85	—	— @100
Penn. and N. Y. Canal, 7s	1,000	— @106
Schuyl. Nav. Canal, mtge. 6s, '95	—	— @ 78½
" " " 2d " 1907	—	— @ 82
" " " 1st mtge. 6s	—	— @ 95
" " " 6s 1882	390	— @ 82
" " " 6s " " 1872,	7,759	97 @ 97
" " " div. scrip	582	95 @ 95¼
Susquehanna Canal, 6s '94	2,000	— @ 77½
" " 7s	—	— @ 89¼
Del. Division Canal 6s	—	— @ 97
Chesapeake & Delaware Canal	—	— @ 85
Susquehanna Coal Co. 7s	—	— @ 70
Total amount of sales	$58,331	

* Asked.

Closing quotations, in the absence of sales, represent the latest prices bid.

(BY CABLE.)

London.

FRIDAY, September 3, 1875.—3 P. M.

The London Stock Market closed steady to-day, with a fair demand for American railroad securities. A decline of ¼ per cent. has transpired in Philadelphia and Reading R. R. shares, and also the same amount in Pennsylvania R. R.

Bank of England rate remains unchanged.

Philadelphia and Reading R.R	51
Pennsylvania R.R	45¼
United States 5-20s new	104¾
Consols for money	94⅛

Gold and Silver Stocks.

SAN FRANCISCO, Sept. 2, 1875.

The failure of the Bank of California, last week, was followed by the temporary suspension of the National Gold Bank and Trust Company, and the Merchants Exchange Bank. The difficulty with the two last named companies was the impossibility of obtaining coin to pay depositors; large disbursements of coin by the United States Treasury, have materially relieved the condition of these institutions; the Merchants Exchange Bank opened its doors at the usual hour to-day, and the National Gold Bank and Trust Company report a decided improvement in their outlook toward a speedy resumption.

Our latest information states that the prospects are brightening, and the general feeling one of buoyancy.

With regard to the affairs of the Bank of California, nothing definite is known as yet, and in the absence of any report from the Directors, all surmises as to its liabilities, or assets, must be put down as premature. A strong effort is being made by the principal stock-holders of the bank to bring about a resumption. The following is an Associated Press despatch, dated San Francisco, Sept 2d, 1875.

"Mr D. O. MILLS authorizes the statement that capitalists interested in the Bank of California will obtain transfers of stock from the stock-holders, relieving them from liability and guaranteeing them against loss, and subscribe the funds necessary to place the bank in a condition to pay all demands and put it on a sound basis. Should any surplus arise in the settlement, it will be credited *pro rata* to the stock-holders. This arrangement will go into effect in a few days.

"There is reason to believe that the Directors of the Bank of California are endeavoring to effect an arrangement with the Oriental Bank of London, looking to assistance from that quarter, in contemplat on of resumption, but nothing definite is known yet."

The opinion seems to gain ground that in event of the bank going into liquidation, arrangements will be made for securing depositors in full, the assets of the concern above its liabilities to the stock-holders being considered sufficient for that purpose.

The latest report in regard to the Bank of California is, that an effort is being made by the leading stockholders of the suspended bank to establish a new institution under a syndicate to take possession of the assets, and compromise the obligations of the old bank.

In addition to the disbursements by the United States Treasury, the United States Branch Mint, in this city, will be ready to issue about $2,000,000 in coin in a few days.

There was a very active demand for money at all the banks to-day, but up to the hour of closing the supply was equal to the demand. Depositors are transacting a usual business.

The *Evening Post*, in commenting on the failure, says—"This failure, while immediately caused by a depositors' run, was directly the outcome of a conflict between two classes of California's speculators, one the Bank of California party, headed by Mr. RALSTON and Mr. SHARON, and the other headed by Messrs. FLOOD, O'BRIEN and HEYDENFELT. The latter party have established a bank in San Francisco, called 'The Bank of Nevada,' with a cash capital of $5,000,000 gold, and a right to increase to $20,000,000. Incidental to this conflict have been the mining properties known as the Savage, the Caledonia, the California, the Ophir, the Consolidated Virginia, the Best and Belcher, the Gould and Curry."

This clique is supposed to have locked up all the money within their power, including a large percentage

of the dividends recently paid to stockholders of the Bonanza Mines, and the deposits in the Savings Banks. The consequence is, no one had means with which to purchase stocks and a fall was the result, this, coupled with the fact that the Bank of California was largely interested in various other enterprises, which required a large amount of money for their prosecution, and which had no relation whatever to the business of a banking corporation, unquestionably hastened the downfall. All of the stock boards have been closed since the panic, and the members are prohibited from transacting any business in stocks, until receiving official notice; we are consequently without quotations. A resumption of operation is talked of, at the beginning of the coming week. A few sales have been reported as being made on the street, at figures probably 10 per cent. lower than quoted in our last issue.

During the week ending August 22, the Consolidated Virginia Mine produced 4,101 tons of ore. On the 17th the mine shipped $385,000 in bullion, and for the first nine days of the fiscal month the amount figures up $609,671, being the product of five days' running. The new joint shaft was down 608 feet at last advices.

The Consolidated Virginia combination is reported to have purchased the French Gold Mine, adjoining the Mariposa, on the Mother Lode, and arranged for sinking a new 1,000 foot shaft at once.

The operations of the Caledonia Mining Company for the past year were as follows:

RECEIPTS.

From assessments	$360,000
Loan from Bank of California	49,000
Floating indebtedness	1,281

DISBURSEMENTS.

Expenditures on new shaft	$202,098
Expenditures on old shaft	133,700
Overdraft of the previous year	47,793

In addition to the new mining companies heretofore reported, the following were organized in San Francisco just previous to the panic last week:

Name.	Location.	Capital.
Allen Mining Company, Nevada		$12,000,000
Savage Mining Co. (increase.) Nevada		11,200,000
Julia Consolidating Mining Co., Nevada		11,000,000
Balance Consolidated Gold and Silver Mining Co., California		10,000 000
Caledonia Mining Co. (increase.) Nevada		10,000,000
Hartford Mining Co. (increase) Nevada		7,000,000
Empire and Lexington Mining Co., Nev		5,000,000
Pacific Mining Co. (increase.) California		2,500,000
Total		78,700,000
Previously reported		159,500,000
Total capital stock		$238,200,000

We note a recent sale of 1,450 shares of the Western Almaden Quicksilver Mining Company stock, located in Santa Clara County, California, at $2 per share.

PROGRESS IN THE SUTRO TUNNEL.—The following is the report of progress in the Sutro tunnel, for week ending August 15, 1875:

Number of feet in tunnel, August 7	10,413
Number of feet driven during week	82
Distance in, August 15	10,495

Details of work performed are as follows, heading being 8x10 feet:

Holes drilled	266
Holes blasted	1,836 feet
Average depth	6,902 feet
Powder consumed	556 lbs
Exploders consumed	279
Rock extracted	1,268 tons

ROCK—Clay and porphyry; soft and dangerous.

The Arizona Mining Company have levied their second assessment of $1 per share, delinquent September 24th.

The Stanislaus River Mining Company want to increase their capital from $1,800,000, in 18,000 shares, to $5,400,000, in 54,000 shares. The vote will be taken on the 20th of September.

The mines of Grand County, New Mexico, are highly prosperous, and are shipping at the rate of $78,000 in bullion per annum.

The United States Mints at Philadelphia, San Francisco and Carson are reported in splendid working condition, running full time. Under the Subsidiary Coinage Act of last January, they are required to coin $70,000,000 bullion for the Treasury Department, in addition to some $24,000,000 of bullion from the Western mines; or a total of $94,000,000 for the year.

The Treasury is informed that the new refinery at San Francisco is now refining 50,000 ounces per day of Dori silver, or about $1,500,000 of bullion, of 35 per cent. in gold.

The total amount of assessments delinquent during the month of August, divided among 22 different mining companies, aggregates $611,850.

The assessments for the first eight months of the year amount to $7,970,260, against $4,029,700 for a corresponding period in 1874, and $4,677,800 during the first eight months of 1873.

QUOTATIONS:

	No. of shares	Aug. 25.	Sept. 2.
Sierra Nevada	100,000	$15	No Board in session during the past week.
Union Consolidated	100,000	8	
Mexican	108,000	19	
Ophir	108,000	55	
California	540,000	57	
Consolidated Virginia	108,000	265	
Best & Belcher	100,800	47	
Gould & Curry	108,000	17	
Savage	16,000	88	
Hale and Norcross	16,000	47	
Cholliar Potosi	28,000	73	
Alpha Consolidated	30,000	18	
Imperial	100,000	21	
Yellow Jacket	24,000	58	
Kentuck	30,070	16	
Crown Point	100,000	26	
Belcher	104,000	25	
Overman	36,400	54	
Caledonia	20,000	18	
Raymond & Ely	30,000	33	
Meadow Valley	60,000	5	
Eureka Consolidated	50,000	27	
Eureka G. V.	20,000	7	

Copper Stocks.

BOSTON, Thursday Evening, Sept. 2, 1875.

Specially reported by WILSON W. FAY & Co., Bankers and Brokers, Room 7, Traveller Building, 31 State street, Boston, Mass.

The Stock Market still remains in the same condition as reported last week.

Allouez has receded a point, selling at $16, against $17 a week ago. Calumet and Hecla is offered at 158¾, against 160 a week ago. There is a little inquiry for Petherick, orders from the Lake to buy it said to be in the market. We note sales during the week of 3 shares Taunton Copper Co., at $600.

The total amount of refined copper shipped from Portage Lake since the opening of navigation to Aug. 21st, 1875, amounts to about 8287 tons.

From the *Marquette Mining Journal* of Aug. 21st we take the following quotations of the stock of various silver mining companies located in the Lake Superior region:

Ontonagon and Lake Superior (Collins)	$5 00	Ontonagon Central	$3 00
Cleveland	2 00	Pittsburgh	2 00
Mammoth	3 00	Scranton	5 00
New York	80	Superior	5 00
Ontonagon	7 00	South Shore	3 00
		Argentine	80

The same contemporary observes:

"The test of the vein rock of the Superior Silver Mining Company was completed on Saturday last, and the result is as encouraging as the most sanguine could have expected. The result from five tons of rock is a brick weighing 224 oz. troy, and at 1.25 per oz. in currency, is worth $280—an average of $56 per ton."

DESCRIPTION.	Par Value.	No. of Shares.	CLOSING. Bid.	CLOSING. Asked.
Allouez	$50	20 000	$15½	$16
Calumet and Hecla	50	80,000	158½	158¾
Central	25	20,000	35	36
Copper Falls	25	20,000	9	9 50
Dana	25	20,000	.25	30
Duncan Silver	20	60,000	19	21
Franklin	25	20,000	13¼	13¾
Madison	25	20,000	20	27
Menard	25	20,000	50	63
Minnesota	25	20,000	2	2 25
National	15	20,000	3	3 12
Petherick	25	20,000	.15-16	1
Pewabic	25	20,000	5	5¼
Quincy	25	20,000	41	41½
Ridge	25	20,000	7⅛	7⅜
Rockland	25	20,000	⅜	⅞
Star	25	20,000	30	⅜
Superior	25	20,000	18	20

Gas Stocks.

NEW YORK, August 27, 1875.

Coupons and interest are payable on the following gas stocks during the month of September at the places annexed.

Citizens Gas Light Co. of Rochester, N. Y., at New York City; Champlain & Urbana Gas Light & Coke Co., at New York City; Columbus, Indiana, Gas Light & Coke Co., at New York City; Westchester Gas Light Co., at New York City; Laclede Gas Light Co., at St. Louis, Mo.; Central Gas Light Co., at New York City. Peoples Gas Light and Fuel Co. of Norristown Pa., interest falling due October 1, payable on and after September 15, inst., at Norristown, Pa.

We note recent sales of the Cincinnati Gas Light and Coke Company at our quotations.

At Visalia, Tulare Co., California, gas works are being erected, the illuminating property of which will be derived from crude petroleum, large quantities of which are said to abound there.

The Northern Liberties Gas Light Company, of Philadelphia, has its semi-annual dividend period in September.

The assessment upon the gas companies of the State of Ohio, to pay the salary and expenses of the Gas Commissioners for the current year, amounts to $3,250, of which sum the Gas Light & Coke Company of Cincinnati pays $1 844, or 57 per cent. of the whole. We are reported the following sales of Eastern Gas Lights Co's. Stock, during the week: 11 Brookline Gas Light at 115½; 3 Dorchester Gas Light at 99½; 3 Lexington Gas Light at 42@48; and 12 Malden & Melrose Gas Light at $100.

We are indebted to the courtesy of Messrs. W. B. SCOTT & Co., Bankers and Dealers in Gas Stocks, No. 24 Pine street, New York, for much of the valuable information contained in the following table:

	Capital Stock.	Par-value.	Offered.	Asked.
Mutual Gas Light Co., N.Y. City	$5,000,000	$100	103¾	105
New York " " " "	4,000,000	100	155	
Metropolitan " " " "	2,500,000	100	†155	
Manhattan " " " "	4,000,000	50	295	298
Harlem " " " "	1,850,000	50	133	
Westchester Co. " New York.	466,000	100	100	
Brooklyn " " " Brooklyn	2,000,000	25	245	250
Citizen's " " " "	1,200,000	20	150	
People's " " " "	1,600,000	10	96	100
Nassau " " " "	1,000,000	25	121¾	
Metropolitan " " "	1,000,000	100	100	
Williamsburgh " "	1,000,000	50	142	
Jersey City and Hoboken Gas Light Company, New Jersey	386,000		160	
People's " " of J. C.			130	
Citizen's G. L. Co., Newark, N.J.				65
Hempstead " " L. I., N.Y.	40,000	100		100
Jamaica, " " " "	25,000	100		100
Citizens', Rochester, "		100	50	
People's G. L. Co. Albany, "	1,000,000	100	45	
Mutual " Buffalo "	750,000	100	50	
Troy G. L. Co., Troy, N. Y.			108	
Baltimore G. L. Co., Balt., Md.	2,000,000	100	190	
People's G. L. Co., Balt., Md	2,000,000	25	108	
Hannibal G. L. Co., Hanni., Mo.	100,000	100	90	
Lewiston G. L. Co., Lewis., Me.	400,000	100		80
Chicago G. L. Co., Chicago, Ill.	2,000,000	100	145	150
Derby G. L. Co., Derby, Conn.		100		80
Woonsocket Gas Light Comp'y, Woonsocket, R.I.	150,000	100	100	
Fort Wayne Gas Light Company Fort Wayne, Ind		100	105	
Northern Liberties Gas Light Company, Philadelphia		25	29¼	
Portland G. L. Co. Portland, Me	350,000	50	72	75
Hartford G. L. Co., Hartford, Ct	700,000	25	41	43
Boston G. L. Co., Boston, Mass.	2,500,000		775	800
Chelsea G. L. Co., Chelsea, "	300,000		130	
Cambridge G. L. Co., Cam., "	700,000		132¾	
Louisville G. L. Co., Louis., Ky.			127	
Cincinnati G. L. Co, Cincin, O.			208	
San Francisco Gas Light Cop'y, San Francisco, Cal			95	97
Montreal City Gas Light Company, Montreal, Canada	1,440,000	40	128½	129½
Toronto Consumers Gas Light Company, (old,) Toronto, Ont.	600,000	50	131	
Halifax G. L. Co., Halifax, N.S.		40		148

† Ex Dividend.

American Mines in London.

DIVIDEND MINES.

CLOSING PRICES—Aug. 21, 4 P. M.

No. of Shares.	MINES.	Par Value of Shares.	Bid.	Total Dividends paid.	Last paid.
		£	£	£ s. d.	
10,000	Battle Mountain, c. (6240 sh.) part paid	5	....	1 10 0	Nov. 1872
15,000	Birdseye Creek, g. Cal.	4	1⅜	0 14 0	June, 1874
40,000	Cedar Creek. g. Cal.	5	¾	0 5 0	June, 1873
15,000	Chicago, s. Utah	10	4	1 12 0	May 1875
21,000	Colorado Terrible, s.-l. Col †	5	2½	0 13 6	Jan. 1875
23,500	Eberhardt & Aurora, s. Nev.†	10	7¾	1 0 0	July, 1871
60,000	Emma, g. s. Utah (35,000 shares part paid	20	1¼	3 12 0	Dec. 1872
15,000	Ferguson, g. Cal.	2	....	0 3 0	Ap'l, 1872
30,000	Flagstaff, s. Utah	10	1⅛	4 2 0	July, 1873
30,000	Gold Run, hydr, Cal.	1	⅛	0 2 4	Oct., 1872
20,000	Last Chance, s. Utah	5	⅞	0 14 0	July, 1873
65,000	London & California, g.†	2	½	0 1 0	July, 1875
15,000	Mammoth Copperopolis, c. s. Utah	10	....	0 5 0	Dec., 1872
5,000	Mountain Chief, s. Utah	10	....	0 4 0	Jan., 1873
125,000	Sierra Buttes, g. Cal.†	2	1	1 14 0	July, 1875
60,000	South Aurora, s. Nev.	5	9-20	0 14 2	Nov., 1873
15,000	Sweetland Creek, g. Cal. †	4	3	3 0 0	Dec., 1874
20,000	Tolima, g. s. (14,000 sh., £4/10 pd.)	5	3	0 11 6	May, 1874

NON-DIVIDEND MINES.

No. of Shares.	MINES.	Paid.	Last price.	Last Call.
		£ s.	£	
30,000	Blue Tent, hydr. g. Cal.	5 0	5	Fully paid
12,000	Camp Floyd, s. Utah	10 0	....	" "
6,000	Clifton, s. Col.	5 0	....	Feb., 1872
10,000	Crescent, g. Cal	10 0	....	Fully paid
10,000	Douglas, s. Georgetown, Col.	5 0	....	" "
35,000	Excelsior, Hyd. Gld. Washing Co., Cal.	6 0	....	Dec., 1871
60,000	Exchequer, g. s. Cal	1 0	⅛	Fully paid
10,000	Goetzel Tunnel Co., Col.	7 0	....	" "
40,000	Holcombe Valley, g. Cal.	1 0	1	July, 1873
20,000	Independence, g. Cal.	5 0	2½	Fully paid
20,000	I. X. L., g. s. Cal.	5 0	2½	" "
15,000	New Pacific, g. s. Nev.	0 10	¾	Dec., 1874
32,500	Ruby Consolidated, s Nev.	10 0	....	Fully paid
15,000	Saturn, s. Utah	5 0	....	
10,000	Silver Plume, s. Col	1 0	....	Fully paid
37,500	Snow Drift, s. Col.	2 0	1⅛	" "
30,000	Tecoma, s. Utah	10 0	¾	" "
14,000	Utah, g.. s -l. Utah	5 0	⅛	" "

c. copper; g. gold; s. silver; s.-l. silver-lead; † quoted on the London Stock Exchange. All of the above are Limited Liability Companies.

American Institute of Mining Engineers.

OFFICIAL BULLETIN.

Announcements to Members and Associates.

I. THE ENGINEERING AND MINING JOURNAL, containing the official reports of proceedings, transactions and notices of meetings, will be sent to each Member and Associate on the payment of his annual dues. Back numbers cannot, as a rule, be sent.

II. Dues (ten dollars per annum) are payable on election and at the annual (May) meeting. Members and associates elected at the February meeting pay ten dollars only to May of the following year. Remittances should be made, as far as possible, by P. O. Order, payable to the Secretary.

III. Blank proposals for membership can be had on application to the Secretary.

IV. The second volume of Transactions has been mailed to all home members and associates not in arrears. Any member who failed to receive his copy will please notify the Secretary promptly. The Institute is not responsible for the loss of the volume in those cases where members have changed their residences and have omitted to inform the Secretary. Volumes I. and II. will be sent, post-paid, to non-members, at five dollars each.

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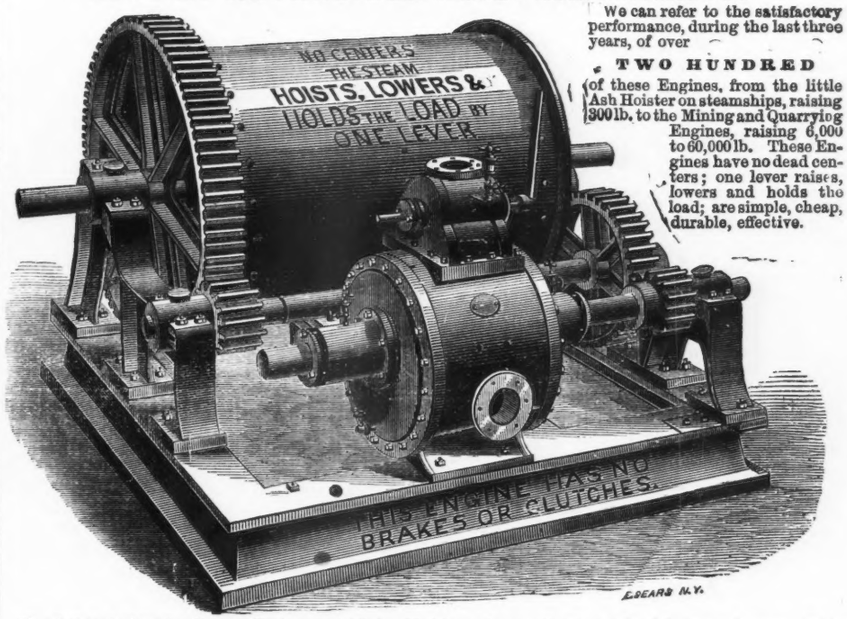

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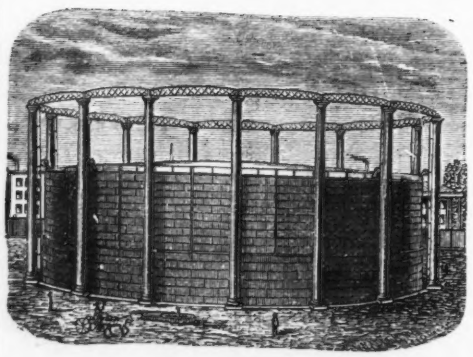

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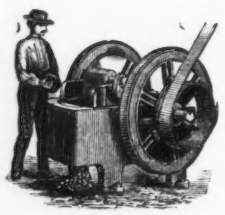

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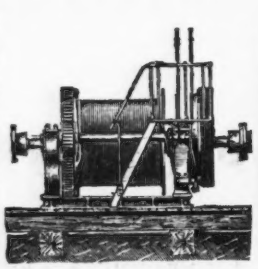

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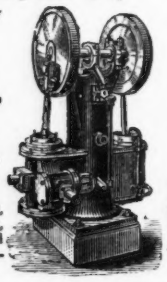

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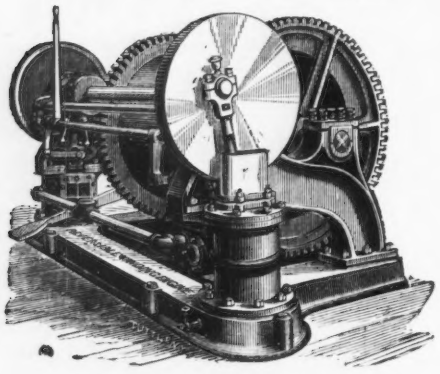

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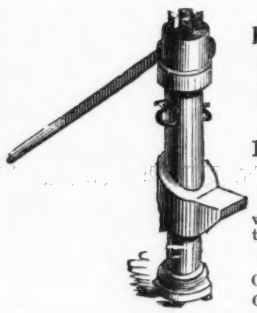

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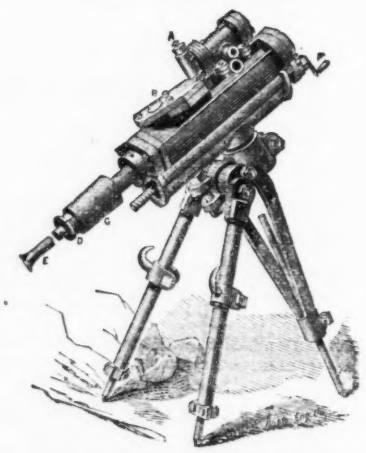

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